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$ax^2 + bx + c = 0$   
 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$   
Government Publications

# The North Pickering Project



Lowry Model Analyses  
of North Pickering:  
Phase II  
[Background Paper No. 3]

B. G. Hutchinson, P.Eng.  
Waterloo, Ontario

December, 1974




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The analyses on which this report is based were performed by John Tofflemire and Hazel Austin.



## 1.0 INTRODUCTION

This report describes one of a series of studies directed towards exploring the probable regional setting of the proposed North Pickering community. The first study was conducted by B.G. Hutchinson and the Economic Planning Group the North Pickering Project Team (1). This study used a version of the Lowry land use model to explore the probable regional setting of North Pickering using data available at that time. The structure of the model is described in detail in that report. The parameters of the model were estimated from 1971 information and the calibrated model was used to explore the probable impacts on North Pickering of alternative regional scenarios.

A second study explored the probable demand for residential locations within North Pickering from employment opportunities located outside of the Community (2). The principal purpose of the second study was to develop an appreciation of the probable role of commuting in the development of North Pickering and the sensitivity of commuting demands to alternative housing policy mixes within North Pickering.

The objective established for the analyses described in this report was (3):

To examine in some detail the probable distribution of service employment within the Oshawa sub-region and to test the viability of various proposals for articulating service employment within the sub-region, particularly with respect to the service employment of North Pickering. This objective was established since the initial analyses indicated that the key to the proper articulation of population and employment within the Oshawa sub-region is the distribution of service employment.

Preliminary results of this phase of the regional analyses have been described previously (4). These earlier analyses had to rely on synthesized information and were directed principally to refining the analysis technique. These studies demonstrated clearly the need for exploring the behaviour of the Oshawa sub-region within the context of the COLUC Region. The analyses showed that the probable interactions between the Oshawa sub-region and the eastern sections of Metropolitan Toronto would be too large to permit the Oshawa sub-region to be examined as a self-contained demographic and economic system. These analyses also demonstrated that the viability of the population-serving employment base of North Pickering is very sensitive to the scale of development of the community. The studies indicated that North Pickering would be dominated by Oshawa in terms of its service employment functions but that a viable service employment base would be developed if North Pickering had a population in excess of about 50,000.



## 2.0 THE ANALYSIS MODEL

The analyses described in this report also used a version of the Lowry land use model. The version of the model used was developed and programmed for computer at the University of Waterloo (5, 6). Figure No. 1 illustrates the fundamental conceptual structure of the Lowry model. This illustration shows that the Lowry model conceives of the major spatial features of an urban area in terms of three broad sectors of activity. These sectors are usually labelled as the basic employment sector, the population-serving employment sector and the population (or household) sector.

### 2.1 THE LOGIC OF THE ANALYSIS MODEL

The spatial inter-dependencies between various types of urban activities are complex. The locational behaviour of some of the chains of urban activities have been shown to be sequential in nature while other sets of urban activities have been shown to locate in a simultaneous way. Figure No. 1 shows that the Lowry model relies essentially on a sequential view of urban activity location. An exogenously specified distribution of basic employment is used by the model to calculate the spatial distributions of households and population-serving employment. The Lowry model relies on two sub-models to execute these calculations and these are referred to as the residential sub-model and the population (-serving) sub-model.

Employment types which are typical of basic, or locationally fixed employment are manufacturing, senior government and airport employment. The main criterion for classifying employment sectors as basic is that their location within a region is not sensitive to shifts in the spatial distributions of households that might be stimulated by changes in land servicing or transport policies.

Retail trade, personal services, primary and secondary school employment are examples of population-serving employment sectors. The principal criterion of population-serving employment is that its location within a region is sensitive to shifts in the spatial distributions of households.

#### .1.1 THE RESIDENTIAL SUB-MODEL

The residential sub-model allocates household demands created by employment opportunities at various locations in the following way:

$$l_{ij} = e_i a [h_j \exp(-\alpha_i d_{ij}) / \sum_j h_j \exp(-\alpha_i d_{ij})] \quad (1)$$



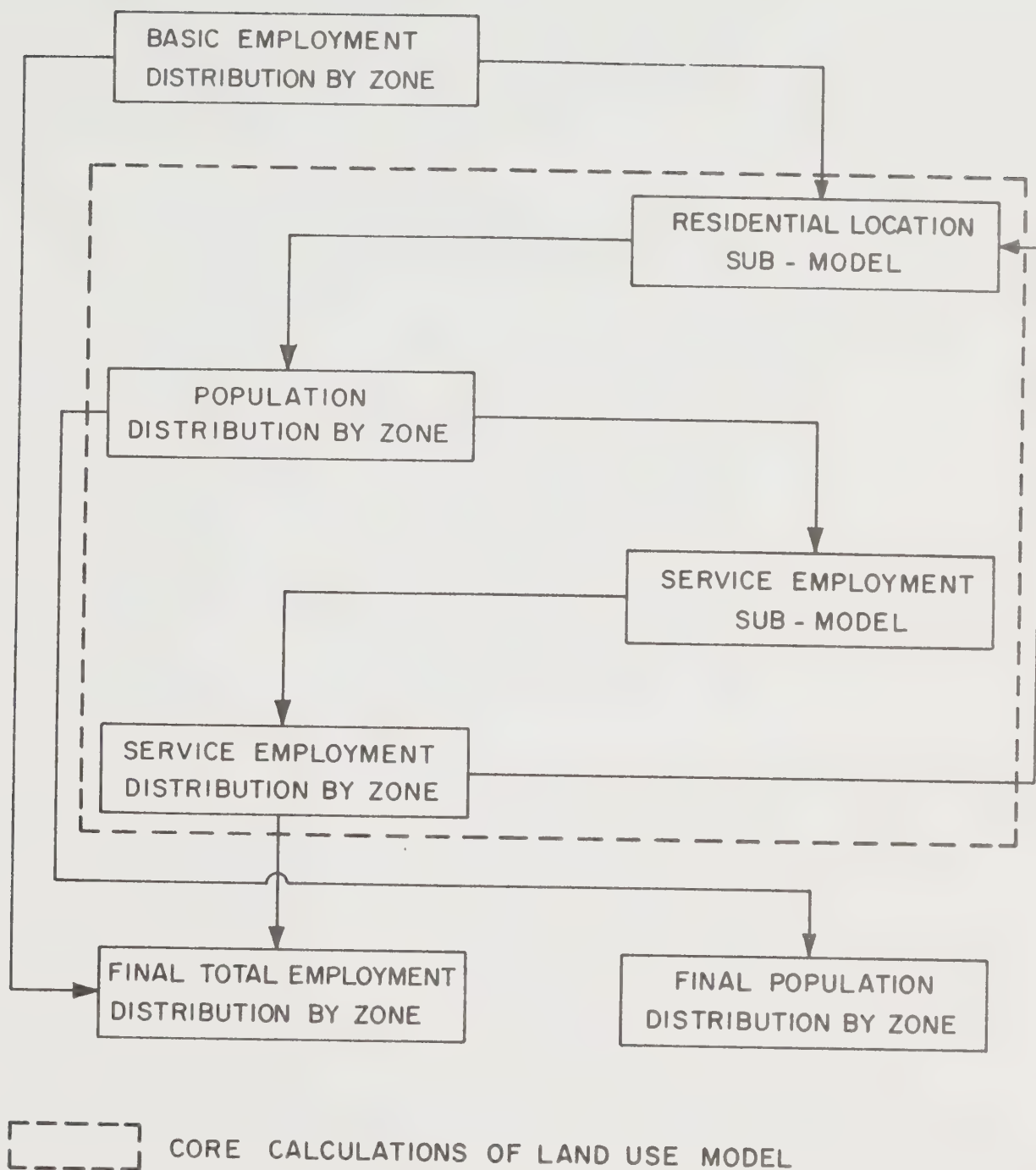


FIGURE 1 - CONCEPTUAL STRUCTURE OF THE LOWRY LAND USE MODEL



$$p_j = \sum_i l_{ij} \quad (2)$$

where  $l_{ij}$  = the number of employees working in zone i who live in zone j

$e_i$  = the total number of employees working in zone i

$a$  = the inverse of the activity rate in terms of persons (or households) per employee

$h_j$  = the residential holding capacity of zone j

$\alpha_i$  = a behavioural parameter which reflects the influence that travel time has on the residential location decisions of employees who work in zone i

$d_{ij}$  = the travel time between zones i and j

$p_j$  = the population (or households) allocated to zone j

$e_i$  = the total employment in zone i

$$= e_i^b + e_i^s$$

$e_i^b$  = the basic employment allocated exogenously to zone i

$e_i^s$  = the population serving employment allocated to zone i by the model

Equation (1) allocates employees working in each zone to the available housing opportunities as a function of the inter-zonal travel times to these residential opportunities. The work to home linkage matrix calculated by equation (1) is used to calculate the spatial distribution of population as shown in equation (2).

### 2.1.2 THE SERVICE SUB-MODEL

The service sub-model allocates the demands for population-serving employment to zones in the following way:

$$l_{ij}^r = p_j b^r [s_i^r \exp(-\beta_j^r d_{ij}) / \sum_j s_i^r \exp(-\beta_j^r d_{ij})] \quad (3)$$

$$e_i^{sr} = \sum_j l_{ij}^r \quad (4)$$

$$e_i^s = \sum_r e_i^{sr} \quad (5)$$

where  $l_{ij}^r$  = the number of people living in zone j who seek type r services in zone i

$b^r$  = the per capita demand for type r service employment throughout the region



$s_i^r$  = the attractivity of zone i as a location for type r service employment

$\beta_j^r$  = a behavioural parameter which reflects the influences that travel time has on residents in zone j in their selection of type r service locations

Equation (3) calculates the home to service type r inter-zonal linkages as a function of the inter-zonal travel times. Equation (4) calculates the spatial distribution of type r population-serving employment from the linkage matrices calculated by equation (3). Finally, equation (5) calculates the spatial distribution of total population-serving employment.

Equations (1) and (2) are linked together by the following equation:

$$e_i = e_i^b + e_i^s \quad (6)$$

The sequence of model calculations described in equations (1) to (6) begins with an estimate of the spatial distribution of total employment. The model performs an iterative series of calculations where the total employment distribution calculated at the end of an iteration is used as input to the subsequent iteration. This process continues until a stable co-distribution of basic employment, population-serving employment and population is obtained.

## 2.2 USE OF THE MODEL FOR ANALYSIS

The land use model requires estimates of the following parameter magnitudes when it is used to analyze alternative horizon year development scenarios:

1.  $a$ , the inverse of the activity rate in persons per employee
2.  $b^r$ , the per capita population-serving employment demand rate for each service employment sector in employees per capita
3.  $\alpha_i$ , the work-home travel time parameter for each employment zone i
4.  $\beta_j^r$ , the home-service travel time parameter for each service employment sector r and residential zone j

Figure No. 2 illustrates the way in which the land use model was used to analyze alternative scenarios in the studies described in this report. Alternative development scenarios embodying different magnitudes of the above parameters were postulated and the model was used to estimate the implications of these different scenarios.



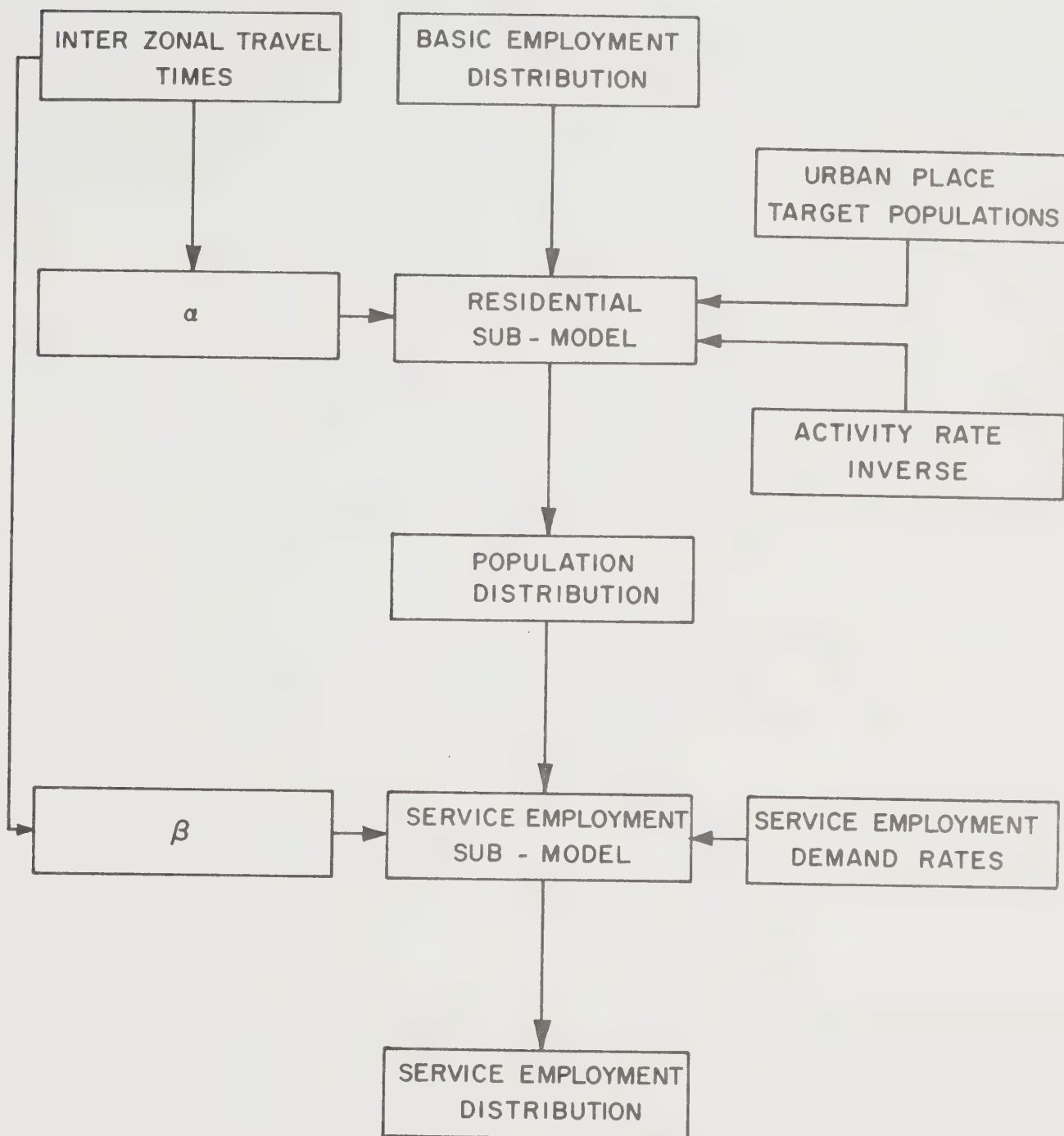


FIGURE 2 - USE OF MODEL IN THE ANALYSIS OF ALTERNATIVE DEVELOPMENT SCENARIOS



### 3.0 ALTERNATIVE REGIONAL DEVELOPMENT SCENARIOS

Three broad regional scenarios were postulated in this report and these scenarios have been labelled scenarios A, B and C. The detailed characteristics of these scenarios are described in Appendix A of this report. Scenarios A and B are similar in terms of the broad distributions of population and employment but differ from each other in that the  $a$  and  $b^r$  parameter magnitudes vary between the two scenarios. With scenario A these magnitudes have been estimated from 1971 census data and the analysis of the census information is presented in Appendix B. Scenario C differs from A and B in that the population and employment allocated to the Oshawa sub-region are significantly higher.

Table No. 1 highlights the principal differences between the three scenarios in terms of population and employment allocated to the Oshawa sub-region. Scenarios A and B have the same population allocated to the sub-region but differ from each other in terms of the activity rate and the proportions of basic and service employment. Scenario C involves a 40 percent increase in population in the Oshawa sub-region and an increase in the activity rate.

Table No. 2 shows the service sector employment demand rates for Scenario A. The total service sector demand rate is 0.239 employees per capita and the population serving employment represents 56.2 percent of the total employment. It has been noted previously that these parameters were derived from an analysis of 1971 census data.

Table No. 3 shows the service sector employment demand rates for Scenario B. The service sectors identified in Table No. 3 differ from those in Table No. 2 since they were derived from a different source. The total service sector demand rate is 0.311 employees per capita and the population serving employment represents 64.3 percent of the total employment.

Table No. 4 illustrates the service sector employment demand rates for Scenario C. The total service employment demand rate is 0.266 employees per capita and the population serving employment represents 62.4 percent of the total employment.

Two different sets of transport behavioural parameters were used in the analyses of alternative scenarios. Table No. 5 shows these two sets of parameters. Set 1 were obtained from an analysis of 1971 data and reflect the conditions that existed at that time. The origin of these particular parameter magnitudes is described in reference (1). The geographic extent of the districts identified in Table No. 5 are illustrated in Figure No. 3.



Table No. 1 - Population and Employment Characteristics  
of Oshawa Sub-Region for Three Scenarios

Scenario	A	B	C
Population	310,000	310,000	431,000
Basic Employment	57,660	55,300	70,900
Service Employment	74,090	85,700	131,670
Total Employment	131,750	141,000	202,570
Service Employment ÷ Population	0.239	0.276	0.305
Population ÷ Total Employment	2.353	2.199	2.128



Table No. 2 - Per Capita Service Employment Demand Rates  
by Sector - Scenario A

Service Employment Sector	Employment Per Capita
Retail	.046
Finance and Real Estate	.015
Education	.028
Health and Welfare	.030
Business and Personal Services	.100
Public Administration	.020
Total	.239



Table No. 3 - Per Capita Service Employment Demand Rates  
by Sector - Scenario B

Service Employment Sector	Employment Per Capita
Transportation	.025
Retail	.055
Finance and Real Estate	.040
Business and Personal Services	.160
Public Administration	.031
Total	.311



Table No. 4 - Per Capita Service Employment Demand Rates  
by Sector - Scenario C

Service Employment Sector	Employment Per Capita
Retail	.061
Fianance and Real Estate	.016
Education	.030
Health and Welfare	.032
Business and Personal Services	.105
Public Administration	.022
Total	.266



Table No. 5 - Transport Behavioural Parameter Magnitudes

District	Set 1		Set 2	
	$\alpha$	$\beta$	$\alpha$	$\beta$
1. Toronto	.042	.046	.050	.150
2. Aurora- Newmarket	.037	.103	.100	.150
3. Mississauga	.091	.149	.120	.150
4. Hamilton	.087	.118	.100	.150
5. Oshawa	.120	.165	.150	.150





DISTRICT	ASSOCIATED ZONES	DISTRICT	ASSOCIATED ZONES
1	18 - 33	5	13-17 , 43 - 44
2	9 - 12 , 39		
3	4 - 8 , 40 - 41		
4	1-3, 34-37, 42		

FIGURE 3 - BEHAVIOURAL PARAMETER DISTRICTS OF THE REGION



The  $\alpha$  parameter magnitudes for districts 2 and 3 indicate that long trip lengths were involved to jobs in these areas in 1971. These trip lengths may be expected to change as the fringe areas of Metropolitan Toronto develop greater balance between housing and job opportunities. The parameters shown in Set 2 represent modifications to the 1971 parameter set and these modifications represent purely subjective estimates of the probable parameter magnitudes. Districts 2, 3, 4 and 5 were judged to become more self-contained by 1986 and the service trip behaviour was assumed to be constant for all residential zones of the region. The principal reason for using this second set of parameters was to explore the sensitivity of the model activity allocations to reasonable changes in the behavioural parameter magnitudes.

The transport network properties used in these analyses were the same as those described in reference (1).

#### 4.0 ALTERNATIVE NORTH PICKERING DEVELOPMENT POLICIES

Three broad regional scenarios have been described in the previous section within which the role of the North Pickering Community has been tested. A number of alternative development policies have been postulated for the North Pickering community within each of three broad regional scenarios. These alternative policies are:

1. North Pickering will be developed to a scale of 34,000 persons in 1986
2. North Pickering will be developed to a scale of 80,000 persons in 1986
3. The proposed Toronto International Airport will be constructed and will employ 22,000 persons by 1986
4. The proposed airport will not be constructed and all airport employment will be concentrated at the existing airport at Malton.

This combination of North Pickering development alternatives with the three regional development scenarios resulted in twenty alternative development strategies for analysis. These alternative strategies are identified in Table No. 6. It should be noted that there are only four alternative strategies within Scenario B as this regional scenario assumes that the proposed airport will be constructed.

The target populations presented in Table No. 6 are used as the population holding capacity for North Pickering under the various regional scenarios.



Table No. 6 - Alternative Development Strategies Analysed

Strategy Number	Regional Scenario	Transport Parameters	Target Population	Proposed Airport
1	A	1	34,000	no
2	A	1	34,000	yes
3	A	1	80,000	no
4	A	1	80,000	yes
5	A	2	34,000	no
6	A	2	34,000	yes
7	A	2	80,000	no
8	A	2	80,000	yes
9	B	1	34,000	airport included in scenario
10	B	1	80,000	
11	B	2	34,000	
12	B	2	80,000	
13	C	1	30,000	no
14	C	1	30,000	yes
15	C	1	80,000	no
16	C	1	80,000	yes
17	C	2	30,000	no
18	C	2	30,000	yes
19	C	2	80,000	no
20	C	2	80,000	yes



#### 4.1 LAND USE MODEL ANALYSES

Figure No. 4 shows the zone system used for the land use model analyses. The model calculated population and service employment allocations by type for each zone are presented in Appendix C for each of the strategies listed in Table No. 6.

Figure Nos. 5, 6 and 7 show the model allocated and target activity allocations to North Pickering for each of the twenty development strategies. The left hand group of results in each diagram was obtained by using the travel parameters estimated from 1971 data. The right hand group of results was obtained using the alternative set of parameters listed in Table No. 5. The odd numbered strategies assume that the proposed airport will not be built while the even numbered strategies include the estimated 1986 employment at the airport.

#### 4.2 DIFFERENCES BETWEEN POLICIES

The evaluation of the alternative development strategies presented in this section of the report concentrate on the impacts on North Pickering. Oshawa and the other lakeshore communities remain viable population and service employment centres under all strategies and the behaviour of these communities is not discussed.

These diagrams demonstrate clearly that the existence of the proposed airport is important to the achievement of the target population levels in the North Pickering community. Figure Nos. 5 and 7 demonstrate that this influence is much more important for regional Scenario A than it is for Scenario C. The principal reason for this is that Scenario C allocates about 120,000 more persons to the Oshawa sub-region in 1986 than Scenario A.

The information presented in Figure Nos. 5 and 7 also demonstrates that the cancellation of the proposed airport will not prevent the North Pickering population targets from being reached providing the planned population of the town is about 80,000. Target populations of around 30,000 for the town will be difficult to achieve without the airport. The principal reason for this is that North Pickering would be dominated by Oshawa and the other lakeshore communities and service employment would be attracted from North Pickering to these communities.

When the alternative set of travel parameters is used the effects described above are magnified. Commuting trip lengths within the Oshawa sub-region are shortened while the service trip lengths are lengthened. Under these conditions more of the household demand created by employment at the proposed airport is allocated to the North Pickering community while more of the



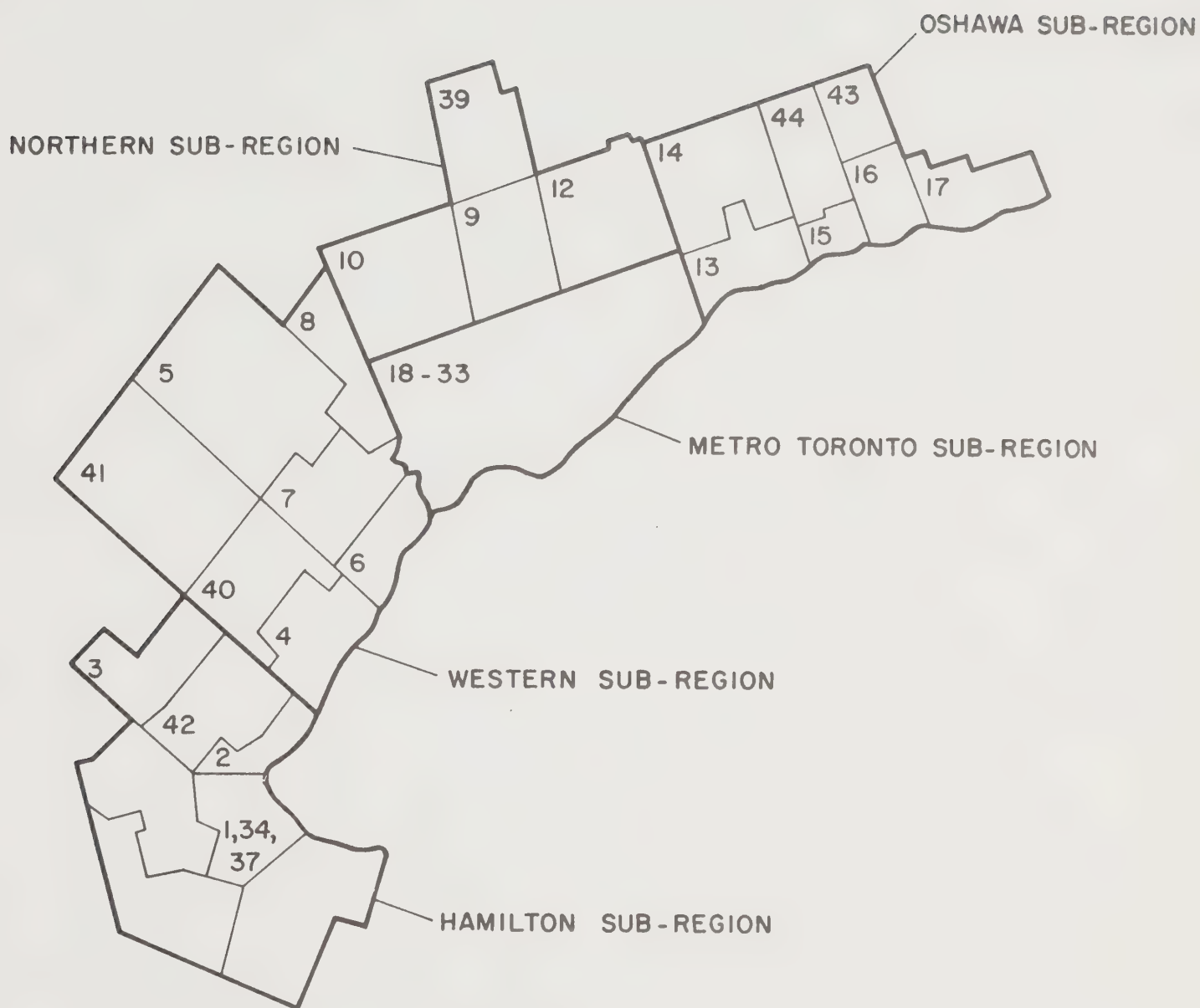


FIGURE 4 - ZONE SYSTEM USED FOR LAND USE MODEL ANALYSES



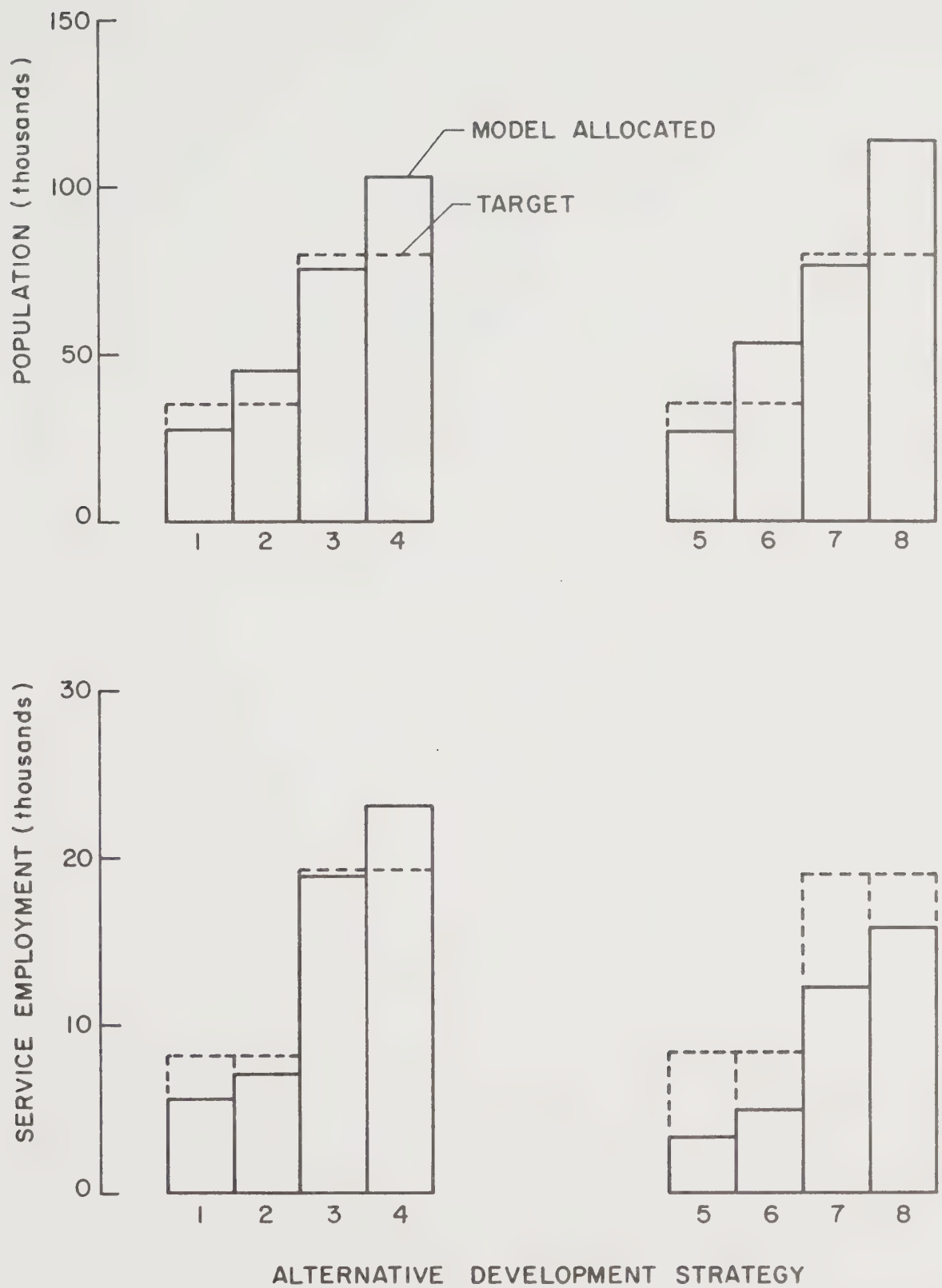


FIGURE 5 - ACTIVITY ALLOCATIONS TO NORTH PICKERING - SCENARIO A



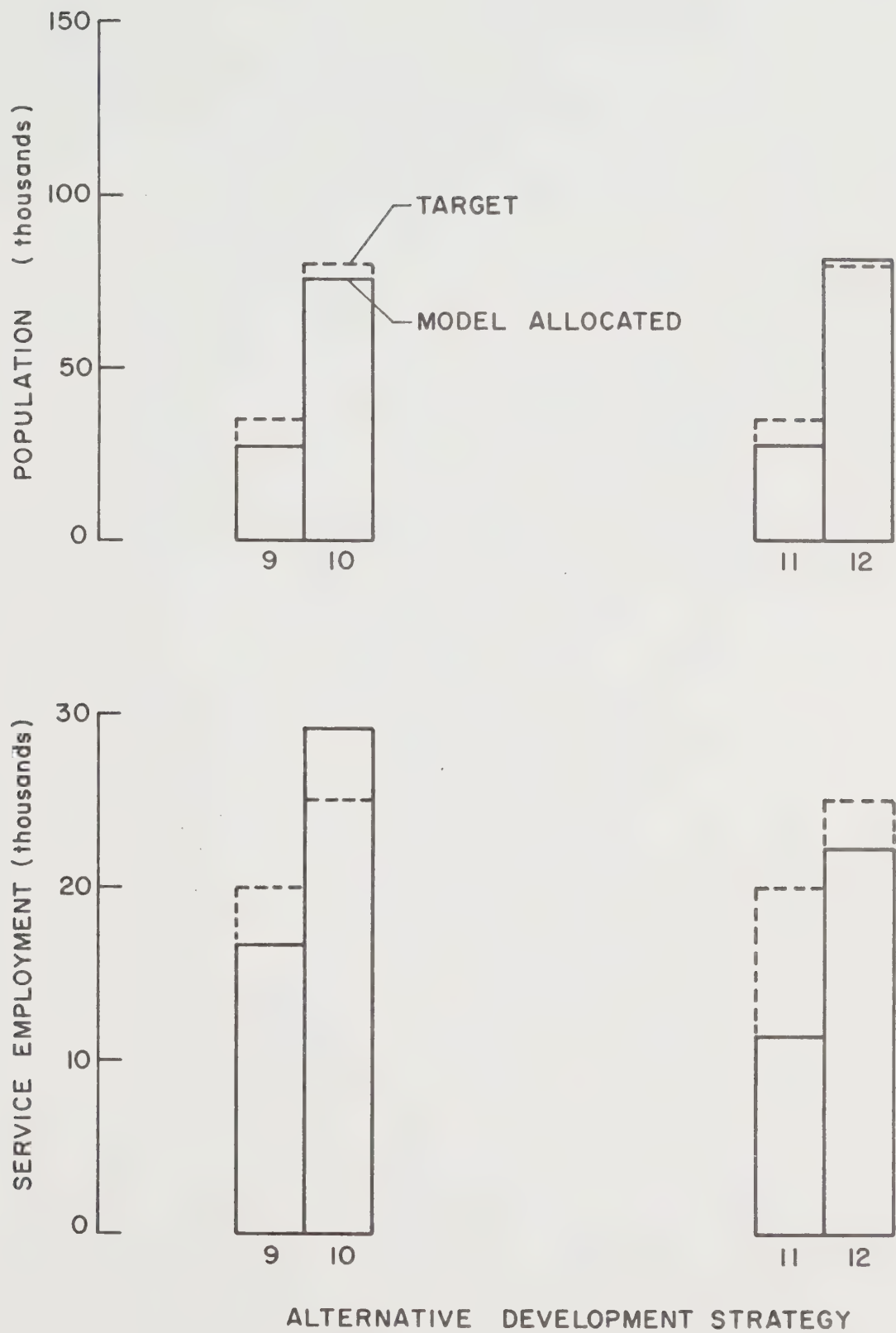


FIGURE 6 - ACTIVITY ALLOCATIONS TO NORTH PICKERING - SCENARIO B



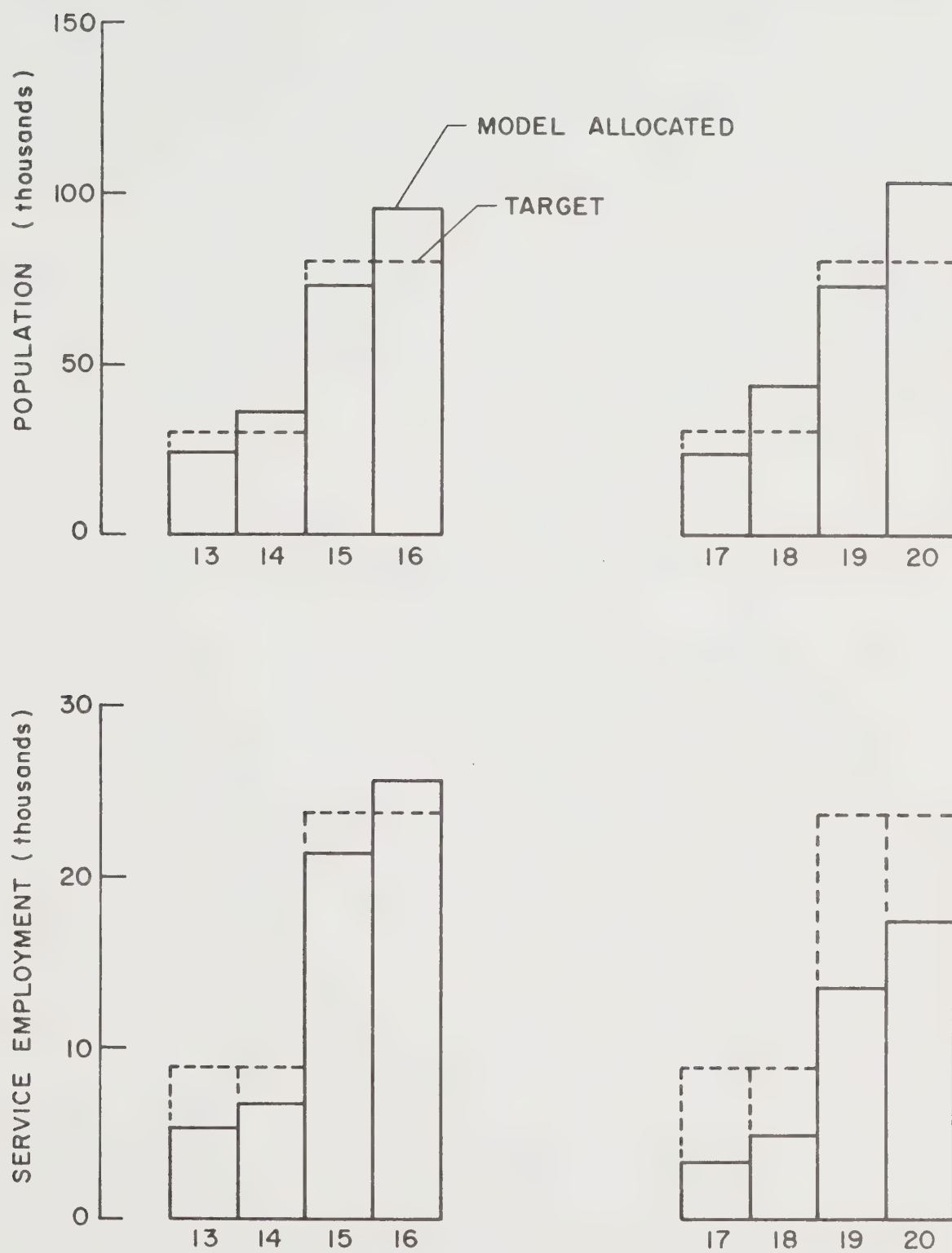


FIGURE 7 - ACTIVITY ALLOCATIONS TO NORTH PICKERING - SCENARIO C



service employment is diverted to the larger lakeshore communities. These effects are much greater for those alternatives which assume a North Pickering scale of about 30,000 people. A comparison of the service employment allocations of Figure No. 7 with those of Figure No. 5 show that this diversion of service employment to the lakeshore communities is more dramatic under Scenario C than under Scenario A. The reason for this is that under Scenario C the scale of Oshawa is assumed to 300,000 people while under Scenario A it is assumed to be 180,000 people.

This preliminary analysis of the land use model analyses demonstrates that the key to the articulation of population within the Oshawa sub-region is service employment. However, the distribution of service employment is a function of the spatial distribution of population within the sub-region. The following section examines these interactions in more detail.

#### 4.2.1 THE DISTRIBUTION OF POPULATION SERVING EMPLOYMENT

In order to develop an initial understanding of the factors influencing the distribution of service employment within the Oshawa sub-region only a limited number of the strategies are discussed. Development strategies 6, 8, 18 and 20 are discussed initially. This set of strategies assumes that the proposed airport will be built and that the revised set of behavioural parameters will reflect 1986 behaviour. Strategies 6 and 8 are for regional Scenario A while 18 and 20 are for Scenario C. The activity rate of both scenarios is equal to 42.5 percent and service employment represents 56.2 percent of the total employment under Scenario A and 62.4 percent under Scenario C. It should also be recalled that 120,000 more residential opportunities are added to the Oshawa sub-region under Scenario C.

Figure No. 8 illustrates the population and service employment allocations to urban places within the Oshawa sub-region for the four scenarios identified previously. This diagram illustrates clearly that for Scenario A, with Oshawa providing 180,000 residential opportunities, the population targets at North Pickering are exceeded for both scales of development. It is interesting to note, however, that the service employment targets for North Pickering are not met. With the 80,000 population alternative for North Pickering 83 percent of the service employment target is achieved while only 59 percent of the target is achieved under the lower scale of development for North Pickering. Service employment targets for Oshawa are just exceeded and Ajax receives an over-allocation of service employment.



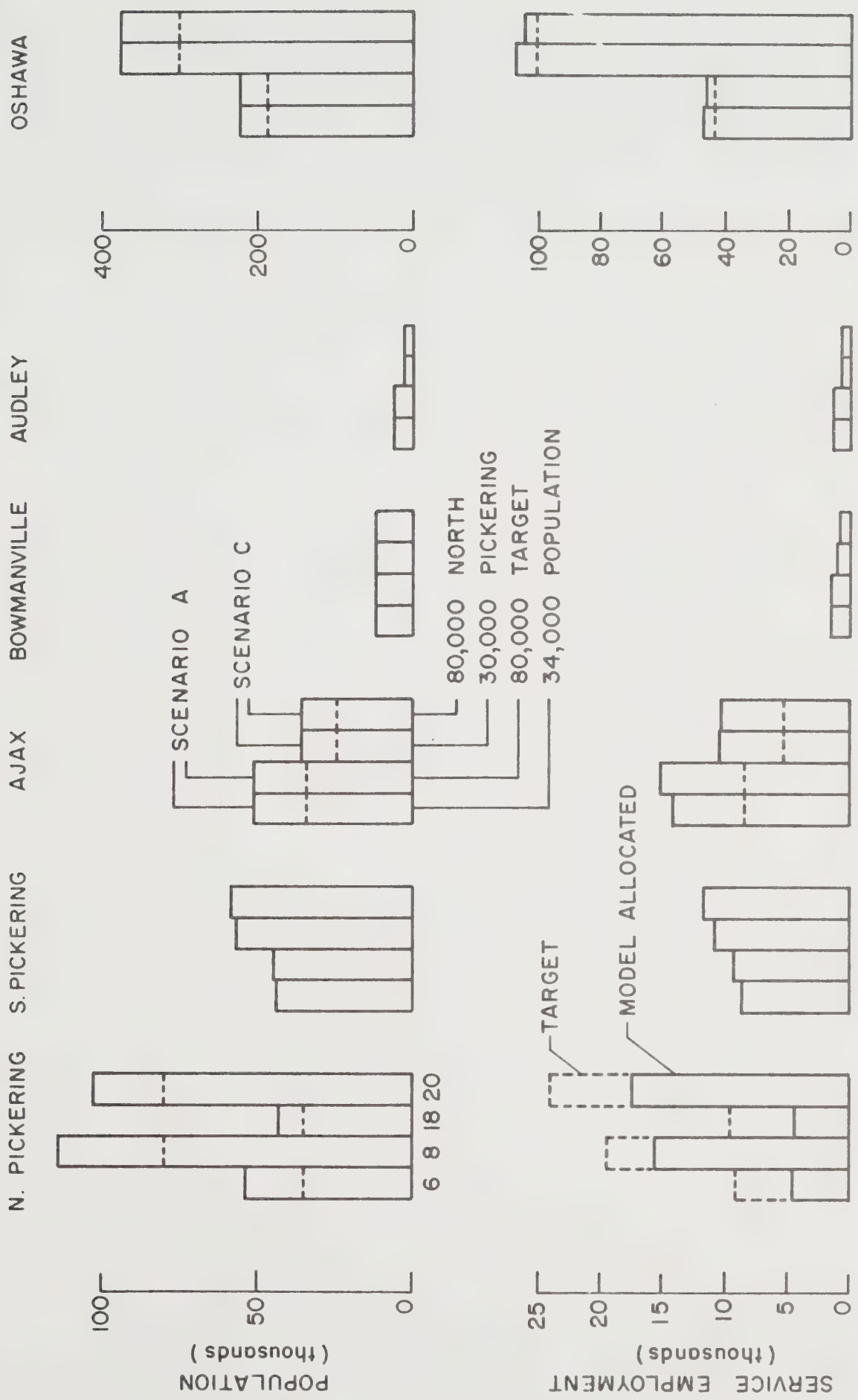


FIGURE 8 - POPULATION AND SERVICE EMPLOYMENT ALLOCATIONS TO URBAN PLACES WITHIN THE OSHAWA SUB-REGION FOR FOUR STRATEGIES



For Scenario C with Oshawa providing some 300,000 residential opportunities the population targets of North Pickering are exceeded. However, the service employment targets are not achieved with only 53 percent of the target being met under the 34,000 population alternative for North Pickering and 73 percent being achieved under the 80,000 population alternative. Figure No. 8 demonstrates that the service employment tends to be focussed in the lakeshore communities of Ajax and Oshawa.

This analysis of population and service employment within the Oshawa sub-region demonstrates the sensitivity of the activity distributions to the relative scales of development of the system of urban places. Since service employment is roughly 60 percent of the total employment this analysis has shown clearly that the spatial articulation of this employment within the Oshawa sub-region is the key to any development concept.

Figure No. 9 shows the variation in the percentage of target service employment that is achieved at North Pickering under various development strategies. This diagram demonstrates clearly that the best strategy to develop North Pickering is 8 which involves Scenario A, North Pickering at a development scale of 80,000 people and the construction of the airport. The diagram demonstrates that it is difficult to develop a viable community at North Pickering under Scenario C unless the airport is constructed. With this strategy Oshawa dominates the entire sub-region and Oshawa and Ajax attract a significant amount of service employment from North Pickering and the smaller urban places of the sub-region.

Figure No. 10 illustrates the service employment by sector allocated by the model to four of the urban places within the Oshawa sub-region for four alternative development strategies. This diagram illustrates that the employment sector that is principally responsible for the short-fall in service employment at North Pickering is the retail trade sector. This effect is particularly dramatic for the strategies which involve lower population targets for North Pickering and for Scenario C. This diagram also demonstrates that much of this retail employment is allocated to Ajax under Scenario A and to Ajax and Oshawa under Scenario C.

## 5.0 CONCLUSIONS

An important consideration in the planning of North Pickering is the probable regional setting of the community in the future. The Borough of Scarborough to the southwest and Ajax and Oshawa to the east are likely to exert strong influences on the new community.



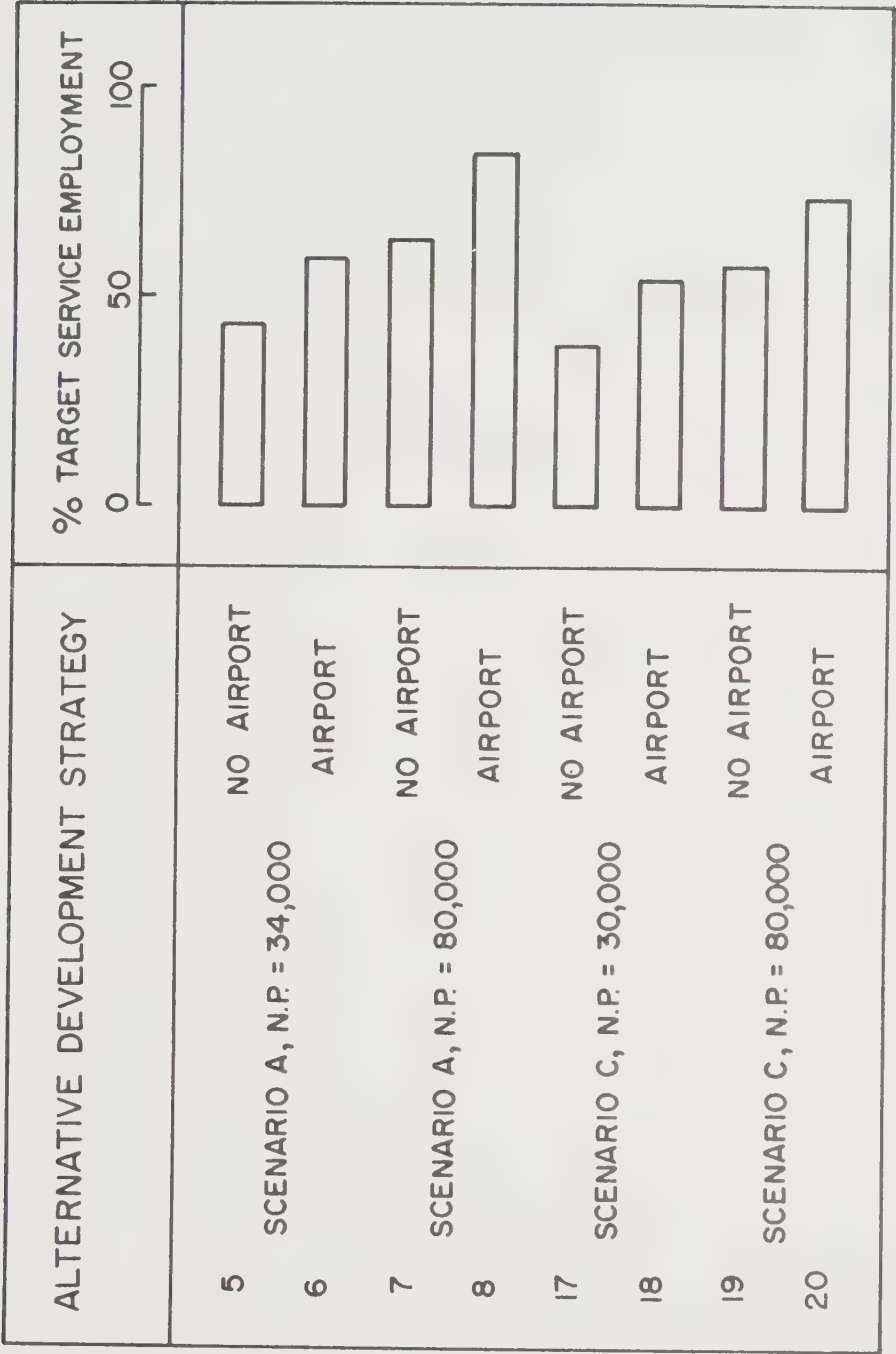


FIGURE 9 - PERCENT TARGET SERVICE EMPLOYMENT ACHIEVED IN NORTH PICKERING FOR VARIOUS DEVELOPMENT STRATEGIES



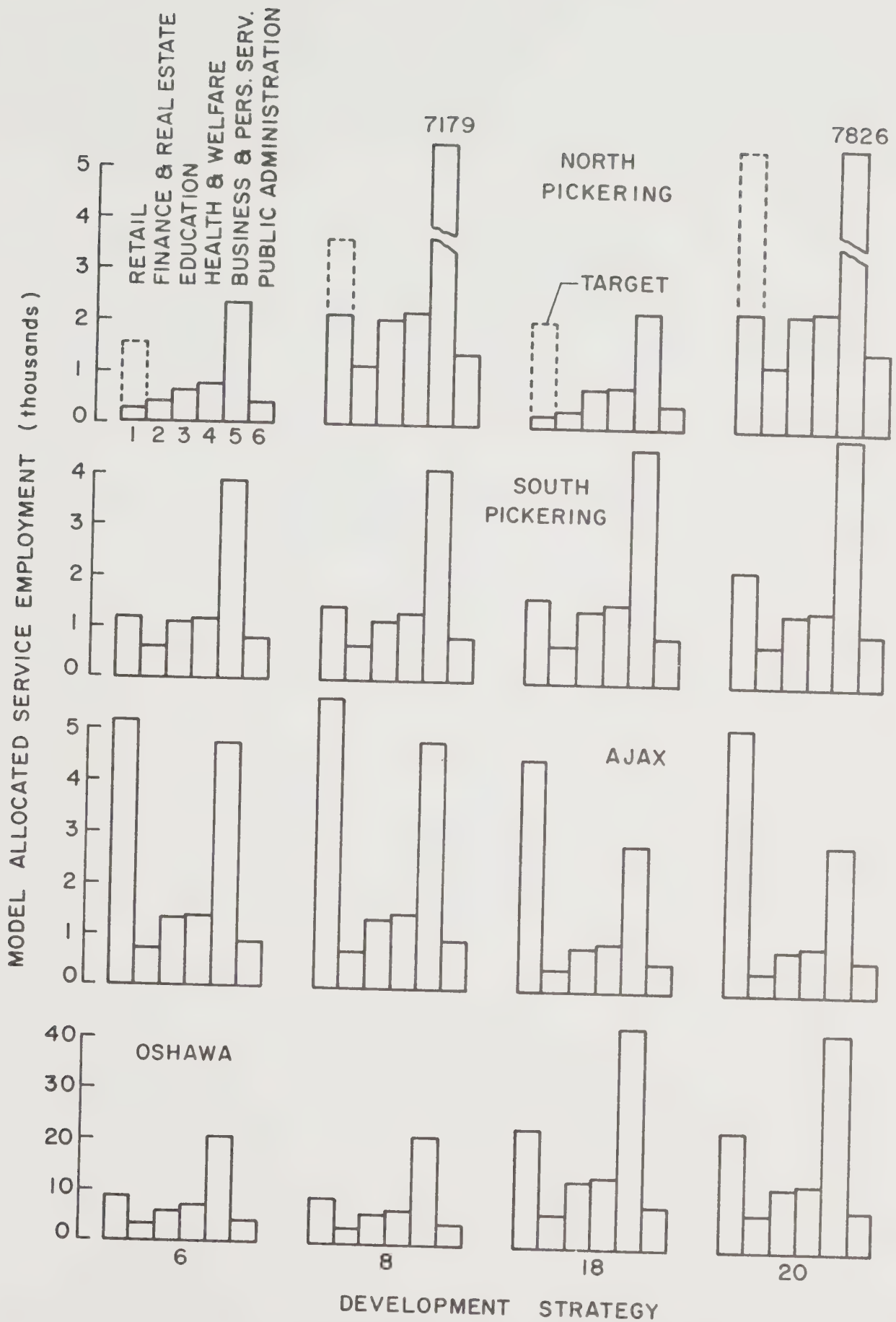


FIGURE 10 - SERVICE EMPLOYMENT ALLOCATIONS BY SECTOR TO URBAN PLACES WITHIN OSHAWA SUB-REGION



Initial studies of the regional setting of North Pickering suggested that the key to the articulation of population within the Oshawa sub-region will be the spatial distribution of population serving employment. If the development scale of the community is too small then much of this service employment will locate in Scarborough or the lakeshore communities to the south and east.

The study described in this report used a Lowry-type land use model to estimate population and population-serving employment allocations to the new community for a range of regional development alternatives. The principal differences between the twenty alternatives examined are in the scale of residential development of North Pickering, the scale of development of Oshawa and the existence or non-existence of the proposed Toronto International Airport.

The set of regional development conditions most favourable to the balanced development of North Pickering are the existence of the airport, a planned residential scale at North Pickering of 80,000 and a development scale of 180,000 for Oshawa. Under these conditions the population target of North Pickering is exceeded and 83 percent of the population-serving employment target is achieved. The most unfavourable conditions occur when the proposed airport is abandoned, North Pickering is developed to a scale of 30,000 and Oshawa to a scale of 300,000. Under these conditions the North Pickering population target is not achieved and service employment is only 38 percent of the target.

The population-serving employment allocation to North Pickering is only maintained at a satisfactory level when the scale of development is around 80,000 persons. At this scale the community provides a sufficiently large local demand for service employment such that it may compete with the surrounding communities. At the smaller scale of development the community is very sensitive to the airport decision and the scale of development of Oshawa.

The most sensitive sector of service employment is the retail employment sector. A major proportion of any deficiencies in service employment in North Pickering are due to the retail employment sector. Shifts in retail employment from North Pickering under the various development alternatives tend to focus in Ajax. Ajax has superior accessibility within the Oshawa sub-region because of its location between North Pickering, South Pickering and Oshawa.



## 6.0 REFERENCES

1. North Pickering Project, "The Iterative Lowry Modelling Exercise: Phase I", 1974.
2. Hutchinson, B.G., "North Pickering Commuter Demand Analysis: 1986 and 2001 Base Years", North Pickering Project, April, 1974.
3. Hutchinson, B.G., "Analysis of the Role of North Pickering Within the COLUC and Oshawa Sub-Regions: Problem Formulation", North Pickering Project, January, 1974.
4. Hutchinson, B.G., "North Pickering Service Centre Role Analysis: 1986 Base Year Analyses", North Pickering Project, April, 1974.
5. Hutchinson, B.G. "Applications of Lowry Type Models in the Toronto Region", Proceedings, U.S./Australian Symposium on Urban Systems Research, National Science Foundation, Washington, D.C., 1974.
6. Hodgins, R., Austin, H. and Hutchinson B.G., "Waterloo Lowry Model Users' Guide", The Transport Group, Department of Civil Engineering, University of Waterloo, 1974.



## APPENDIX A - CHARACTERISTICS OF REGIONAL DEVELOPMENT SCENARIOS

### A.1 INTRODUCTION

This appendix describes in detail the three regional scenarios established for the COLUC Region within which the role at the proposed North Pickering Community was examined. The three scenarios are based on studies performed by the COLUC Task Force. The scenarios are developed for the 1986 horizon year. The population and employment targets for each zone are summarized in Table No. A.1. The origins of these scenarios are described in the following sections.

### A.2 REGIONAL SCENARIO A

This scenario is based on a report prepared for the COLUC Task Force by Murray V. Jones and Associates and Peat, Marwick and Partners entitled "Population and Employment Allocations: 1971, 1986 and 2001", April, 1974. The 1986 population allocations to urban centres developed in the above report provided the starting point for the development of this scenario. The per capita employment rates shown in Table No. A.2 were developed from 1971 census data and applied to the 1986 population allocations to obtain basic and service employment targets for the urban places within the COLUC Region. This procedure produced an overall activity rate of 42.5 percent and service employment equal to 56.2 percent of the total employment.

The above mentioned report did not provide estimates for the individual zones of Metropolitan Toronto or Hamilton. Estimates for these zones were prepared by allocating the aggregated estimates to zones in proportion to the allocations reported in reference (1) of the main body of this report.

### A.3 REGIONAL SCENARIO B

This scenario is also based on the COLUC Task Force report mentioned previously. In this scenario both the population and employment distributions suggested in the report are used. The activity rate for this scenario is 49.3 percent rather than the 42.5 percent of Scenario A. The employment categories of the above mentioned report were assigned to the basic and service employment sectors in the following way:

1. basic employment: manufacturing and wholesale
2. service employment: retail, service and other



The service employment was disaggregated into five sectors to produce the per capita rates by service employment sector shown in Table No. 3 of the main body of the report. In this scenario service employment accounts for 64.3 percent of the total employment of the region. The total population and the population distribution by zone is the same for Scenario A and B but there are 255,000 more jobs in the regional system under Scenario B than under Scenario A.

#### A.4 REGIONAL SCENARIO C

This scenario is based on a report prepared for the COLUC Task Force by Woods, Gordon and Company entitled "The Preferred Phasing of Population and Employment Allocations for COLUC", April, 1974. This scenario allocates higher population and employment totals to the Oshawa sub-region and the population and employment distributions presented in Table No. A.1 have been modified. The service employment sector of this scenario was disaggregated into the six sectors used for Scenario A. However, the per capita employment rates used are different from Scenario A.

The Woods, Gordon and Company report used an activity rate of 48.7 percent and a retail employment demand rate of 0.061 employees per capita. Both of these figures are significantly higher than the 42.5 percent activity rate and 0.046 retail employees per capita of Scenario A. The higher retail employment demand rate was used in Scenario C but the other service employment rates of Scenario A were adjusted to produce an activity rate of 42.5 percent. With this scenario the service employment represents 62.4 percent of the total employment.



Table No. A.1 - Population and Employment Allocations for Three Regional Development Scenarios

Zone No.	Population		Basic Employment			Service Employment		
	A & B	C	A	B	C	A	B	C
1	190,910	273,236	24,790	28,420	23,189	45,630	97,900	78,171
2	105,000	100,000	19,530	13,400	8,635	25,090	25,600	22,899
3	13,000	9,000	2,420	1,000	777	3,100	2,000	2,062
4	105,000	66,000	19,530	20,400	10,048	25,090	27,600	15,177
5	125,000	92,000	23,250	18,300	14,003	29,880	18,700	21,152
6	280,000	225,000	52,080	46,100	31,909	66,920	86,900	56,726
7	60,000	54,000	11,160	4,200	8,218	14,340	4,800	12,414
8	25,000	18,000	4,650	22,600	2,738	5,970	19,400	4,136
9	47,000	45,000	8,740	4,800	5,052	11,240	8,200	12,368
10	7,000	6,000	1,300	2,300	674	1,680	1,700	1,649
11	0	0	0	0	0	0	0	0
12	21,000	18,000	3,910	3,100	2,021	5,010	2,900	4,948
13	40,000	58,000	7,440	1,800	9,430	9,560	8,200	12,578
14	80,000	30,000	14,880	25,800	4,830	19,120	24,880	8,971
15	34,000	24,000	6,320	4,900	3,902	8,130	5,100	5,204
16	180,000	300,000	33,480	41,800	49,647	43,020	49,200	100,797
17	15,000	15,000	2,790	1,500	2,439	3,590	2,500	3,254
18	153,760	160,766	68,780	63,070	62,322	36,740	337,760	387,269
19	257,180	268,894	28,550	26,180	25,874	61,470	44,150	45,318
20	262,140	274,080	62,550	57,360	56,680	62,630	59,610	58,931
21	233,370	244,002	18,040	16,540	16,342	55,780	87,880	100,067
22	123,260	128,872	26,250	24,070	23,784	29,470	31,000	34,180
23	255,440	267,079	19,740	18,100	17,890	61,040	33,990	33,678
24	69,950	71,048	34,550	31,680	31,308	16,250	25,100	25,843
25	187,490	196,030	39,440	36,180	35,738	44,800	42,100	45,106
26	73,660	77,012	46,220	42,380	41,882	17,610	16,230	16,200
27	142,600	149,098	49,680	45,560	45,018	34,080	27,930	30,242
28	160,700	168,026	3,460	3,170	3,135	38,390	34,760	35,230
29	73,660	77,012	2,630	2,410	2,383	17,590	11,100	12,870
30	213,280	222,999	46,960	43,060	42,552	50,980	52,780	54,820



Table No. A.2 - Per Capita Employment Rates by Sector

Employment Sector	Employment Per Capita
Primary	.007
Manufacturing	.140
Construction	.024
Wholesale	.015
Basic Sub-Total	.186
Retail	.046
Finance and Real Estate	.015
Education	.028
Health and Welfare	.030
Business and Personal Service	.100
Public Administration	.020
Service Sub-Total	.239
Total	.425



The service employment was disaggregated into five sectors to produce the per capita rates by service employment sector shown in Table No. 3 of the main body of the report. In Scenario B service employment accounts for 64.3 percent of the total employment of the region. The total population and the population distribution by zone is the same for Scenarios A and B but there are 255,000 more jobs in the COLUC regional system under Scenario B than under Scenario A.

#### A.4 REGIONAL SCENARIO C

This scenario is based on a second regional development concept postulated by TEIGA. With this scenario higher population and employment totals are allocated to the Oshawa sub-region. The service employment sector of this scenario has been disaggregated into the six sectors used for Scenario A. However, the per capita service employment demand rates differ from Scenario A.

The regional concept postulated by TEIGA uses an activity rate of 48.7 percent and a retail employment demand rate of 0.061 employees per capita. These are both higher than the 42.5 percent activity rate of 0.046 retail employees per capita for Scenario A. The higher retail employment demand rate has been used for Scenario C but the other per capita service employment demand rates have been adjusted to produce an activity rate of 42.5 percent. With this scenario, service employment represents 62.4 percent of the total employment.



## APPENDIX B - ANALYSIS OF 1971 CENSUS OF CANADA INFORMATION

The population serving sub-model of the land use model used for the analyses described in this report used per capita employment rates for various employment sectors which are based on the 1971 census of Canada. As employment data were not available directly, labour force information had to be used to develop these per capita rates. Clearly, labour force by sector in an urban community is not equal to the employment by sector in that urban place for large metropolitan regions. However, if one assumes that labour force by sector is equal to employment by sector for the entire metropolitan region then the average per capita employment rates derived from labour force data should be reasonable.

Table No. B1 shows the per capita employment rates by sector established from this analysis. The table indicates the economic activity sectors that were classified as basic and those that were classified as service. A total employment rate of 0.425 employees per capita is suggested from the 1971 census data with service employment being 56.2 percent of the total employment.

Figure Nos. B.1 to B.12 show the population of each urban community plotted against the per capita labour force magnitudes for a variety of sectors. The figures are as follows:

- Figure B.1 - Population vs Total Employment Per Capita
- Figure B.2 - Population vs Primary Employment Per Capita
- Figure B.3 - Population vs Manufacturing Employment Per Capita
- Figure B.4 - Population vs Construction Employment Per Capita
- Figure B.5 - Population vs Wholesale Trade Employment Per Capita
- Figure B.6 - Population vs Retail Employment Per Capita
- Figure B.7 - Population vs Finance and Real Estate Employment Per Capita
- Figure B.8 - Population vs Education Employment Per Capita
- Figure B.9 - Population vs Health and Welfare Employment Per Capita
- Figure B.10 - Population vs Personal Services Per Capita
- Figure B.11 - Population vs Service Employment Per Capita
- Figure B.12 - Population vs Public Administration Employment Per Capita



Table No. B1 - Per Capita Employment Rates

Economic Activity	Employment Per Capita
Primary	.007
Manufacturing	.140
Construction	.024
Wholesale	.015
Total Basic	.186
Retail	.046
Finance and Real Estate	.015
Education	.028
Health and Welfare	.030
Business and Personal Services	.100
Public Administration	.020
Total Service	.239
Total	.425



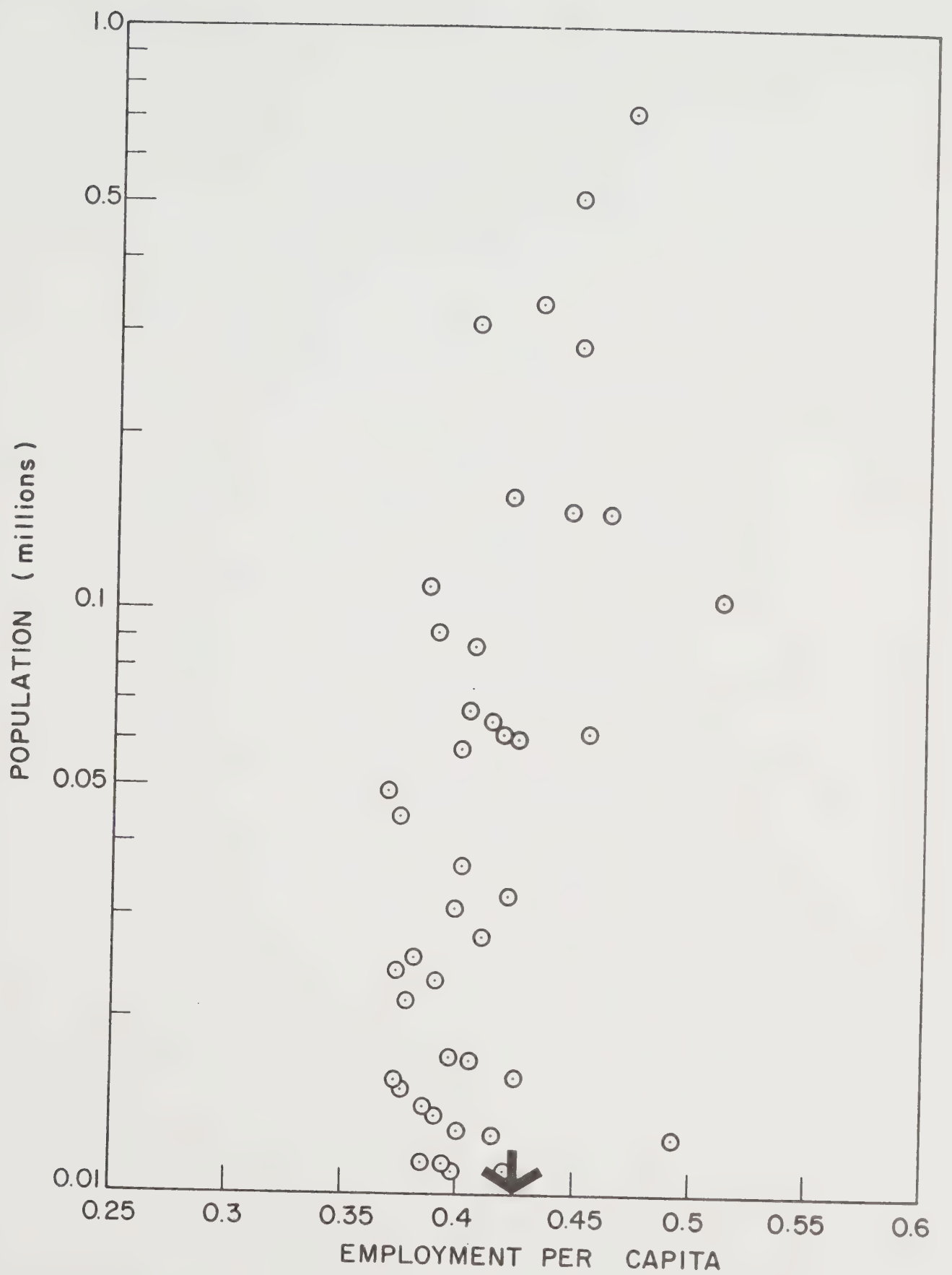


FIGURE B.1 - POPULATION vs TOTAL EMPLOYMENT PER CAPITA



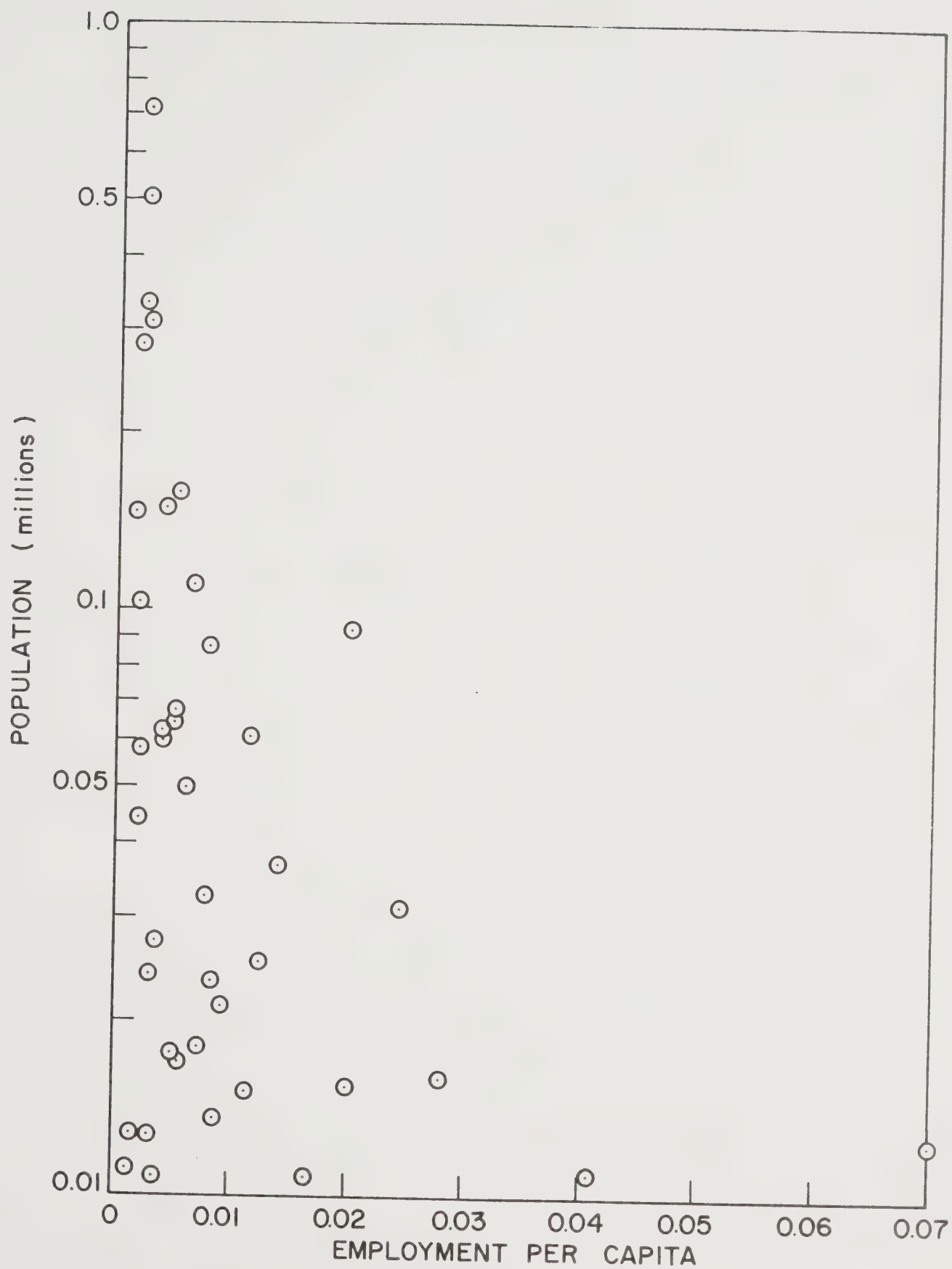


FIGURE B.2 - POPULATION vs PRIMARY EMPLOYMENT PER CAPITA



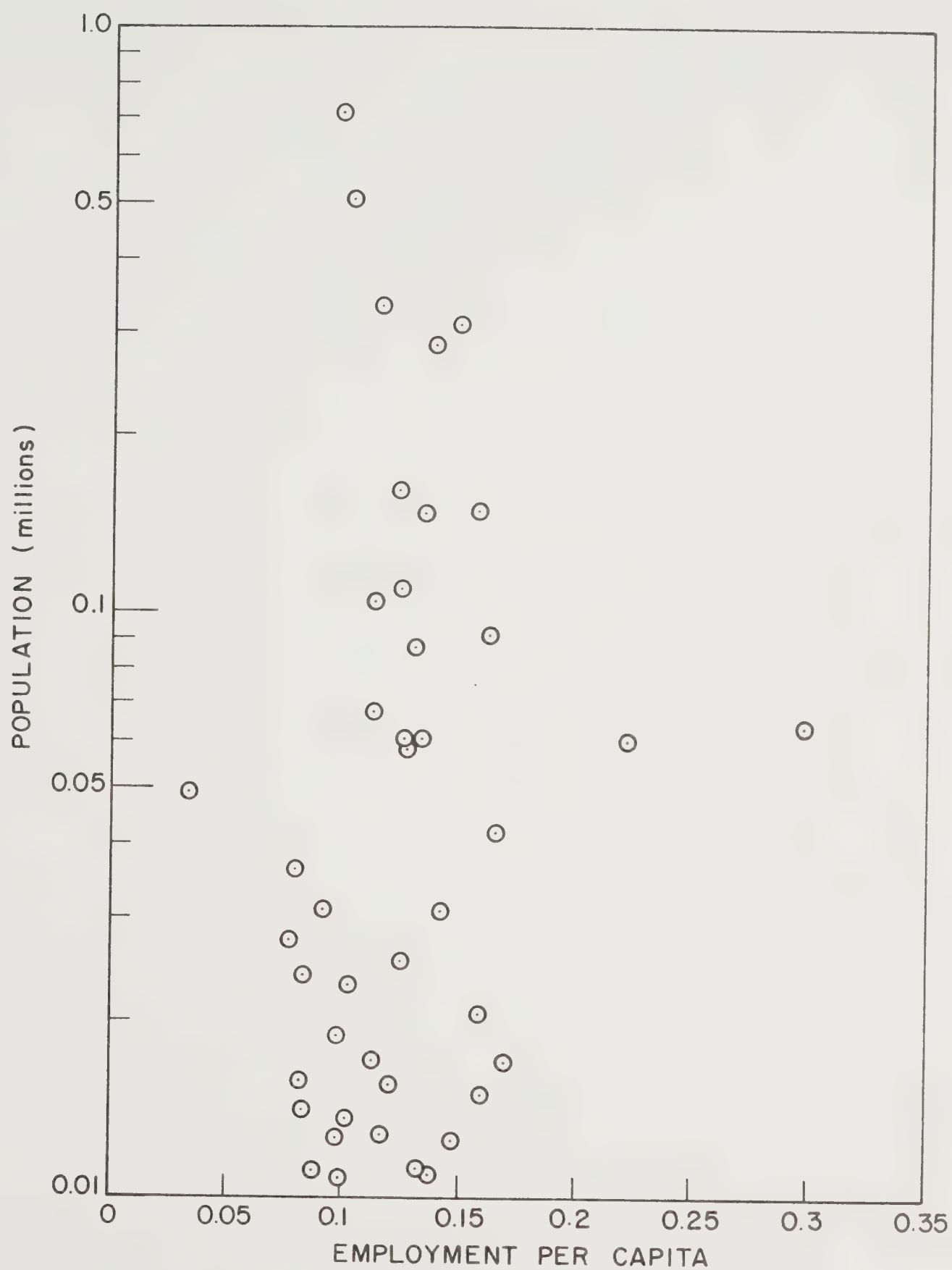


FIGURE B.3 - POPULATION vs MANUFACTURING EMPLOYMENT PER CAPITA



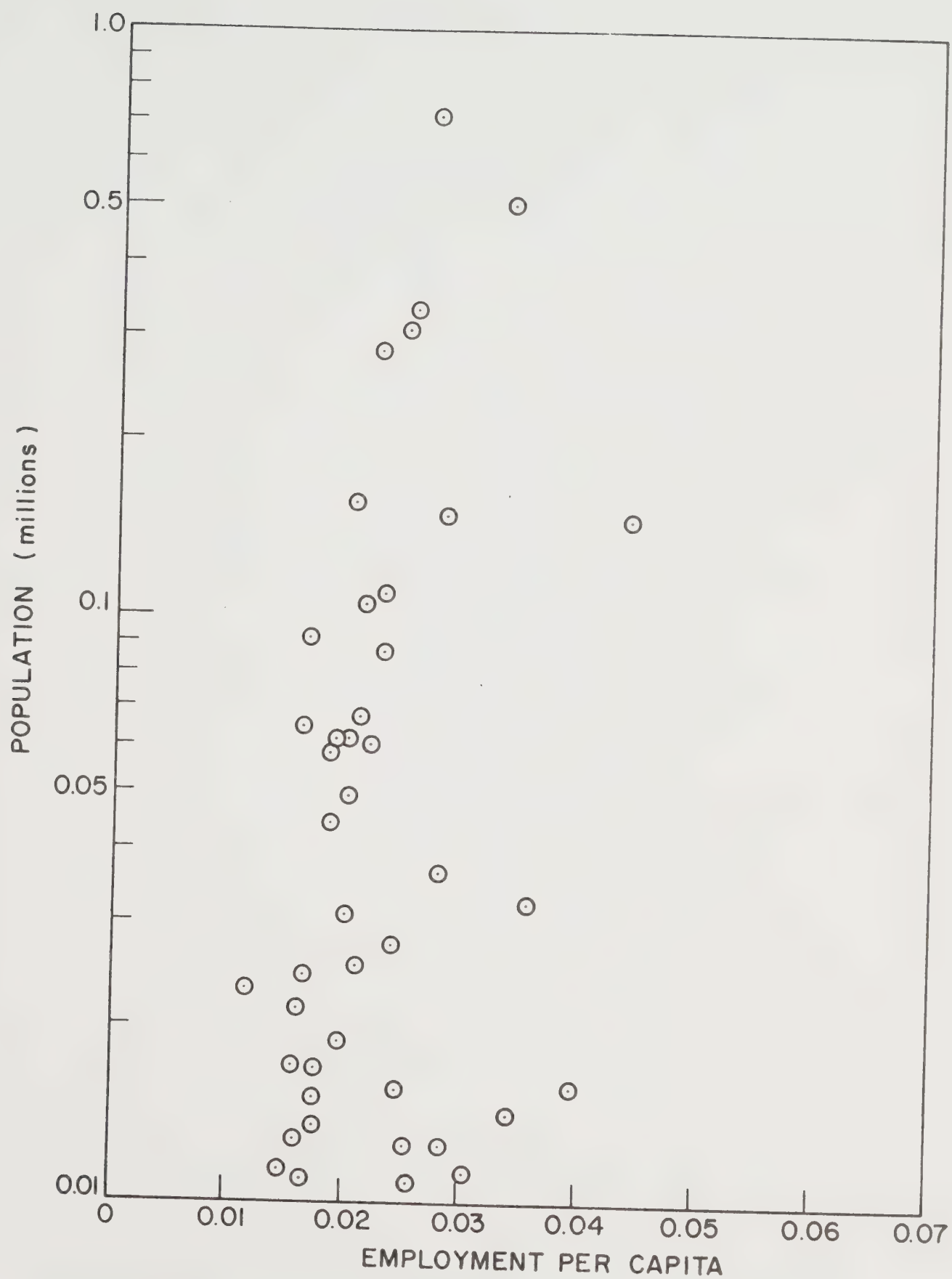


FIGURE B.4 - POPULATION vs CONSTRUCTION EMPLOYMENT PER CAPITA



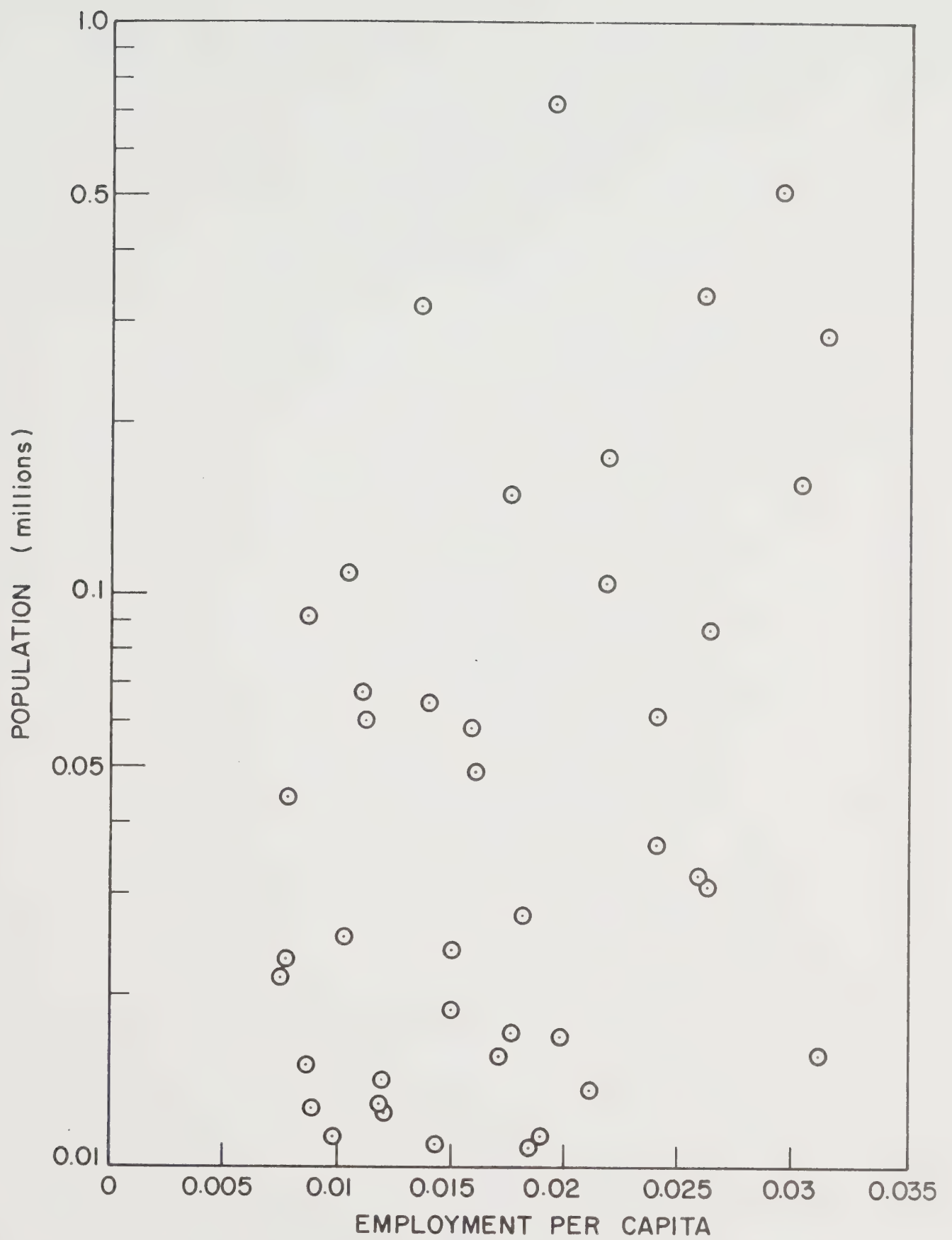


FIGURE B.5 - POPULATION vs WHOLESALE TRADE EMPLOYMENT PER CAPITA



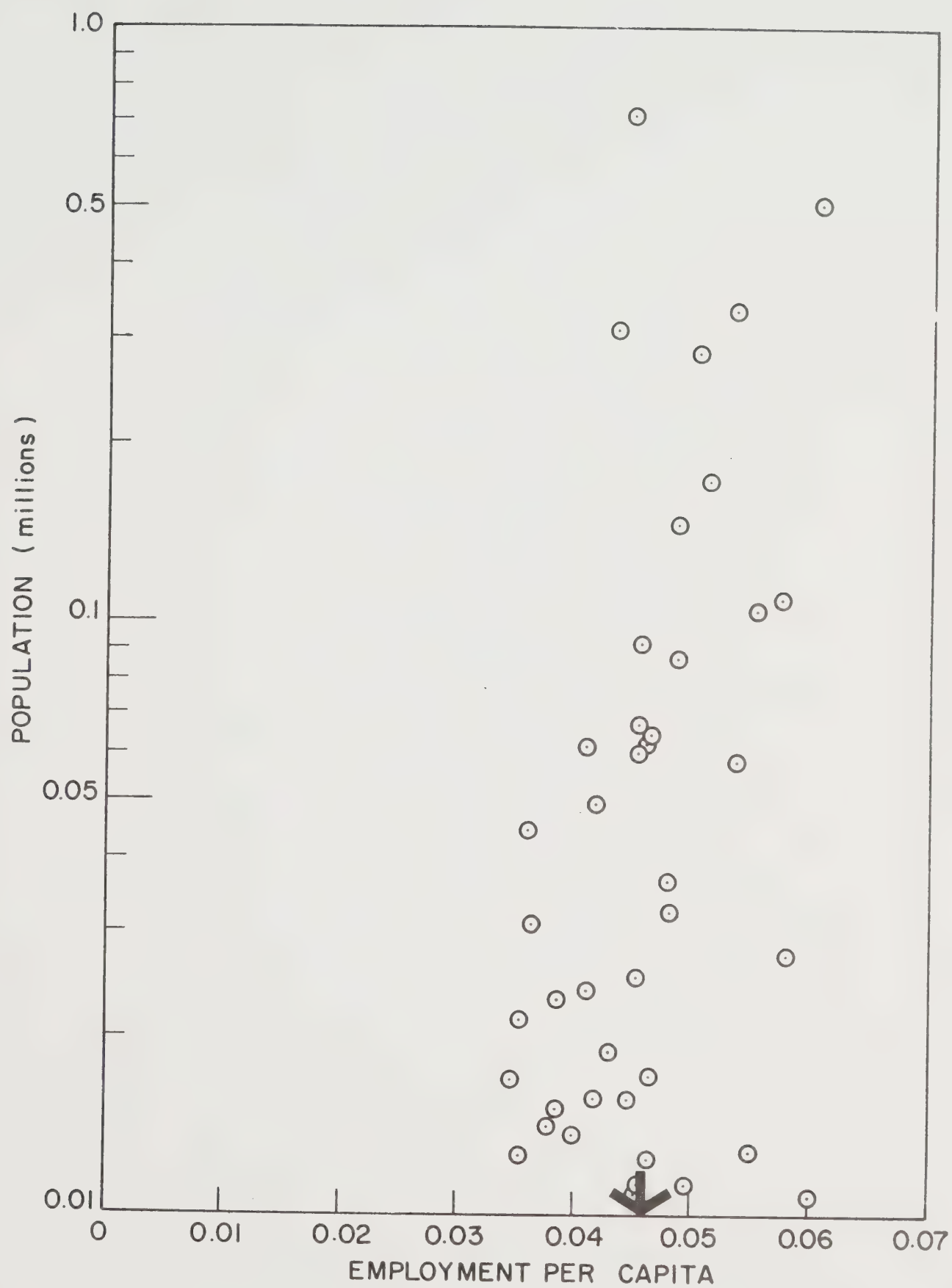


FIGURE B.6 - POPULATION vs RETAIL EMPLOYMENT PER CAPITA



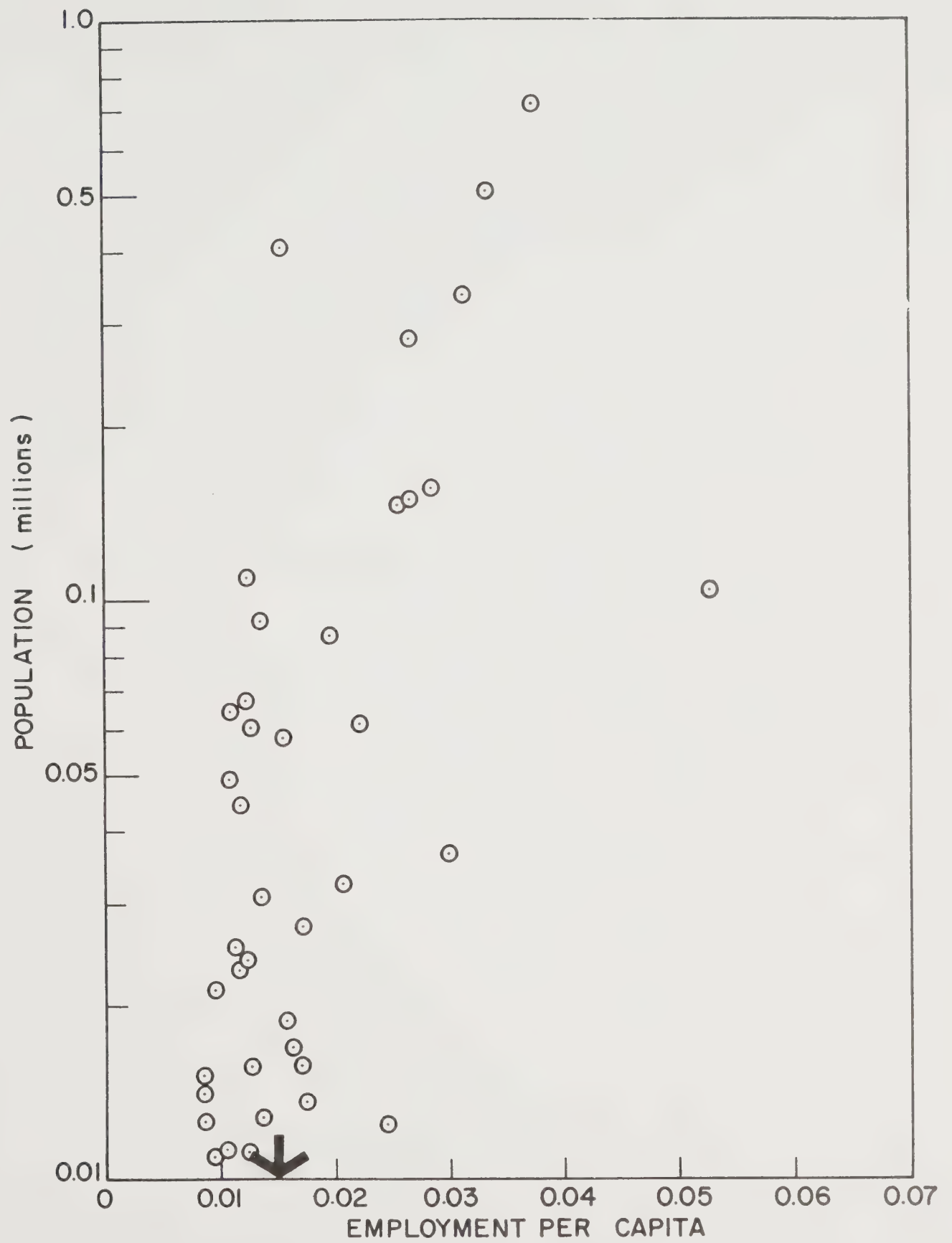


FIGURE B.7 - POPULATION vs FINANCE & REAL ESTATE EMPLOYMENT PER CAPITA



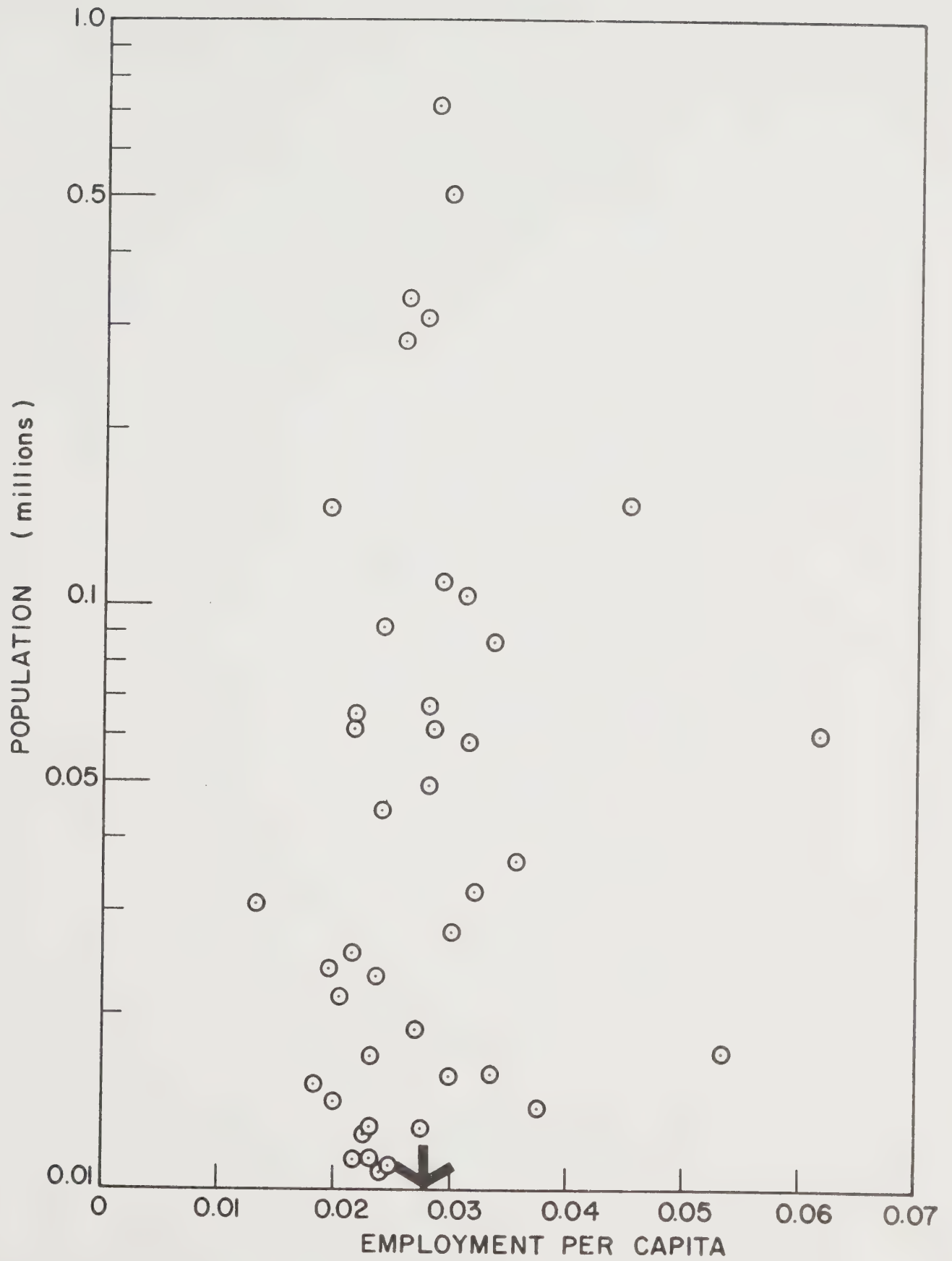


FIGURE B.8 POPULATION vs EDUCATION EMPLOYMENT PER CAPITA



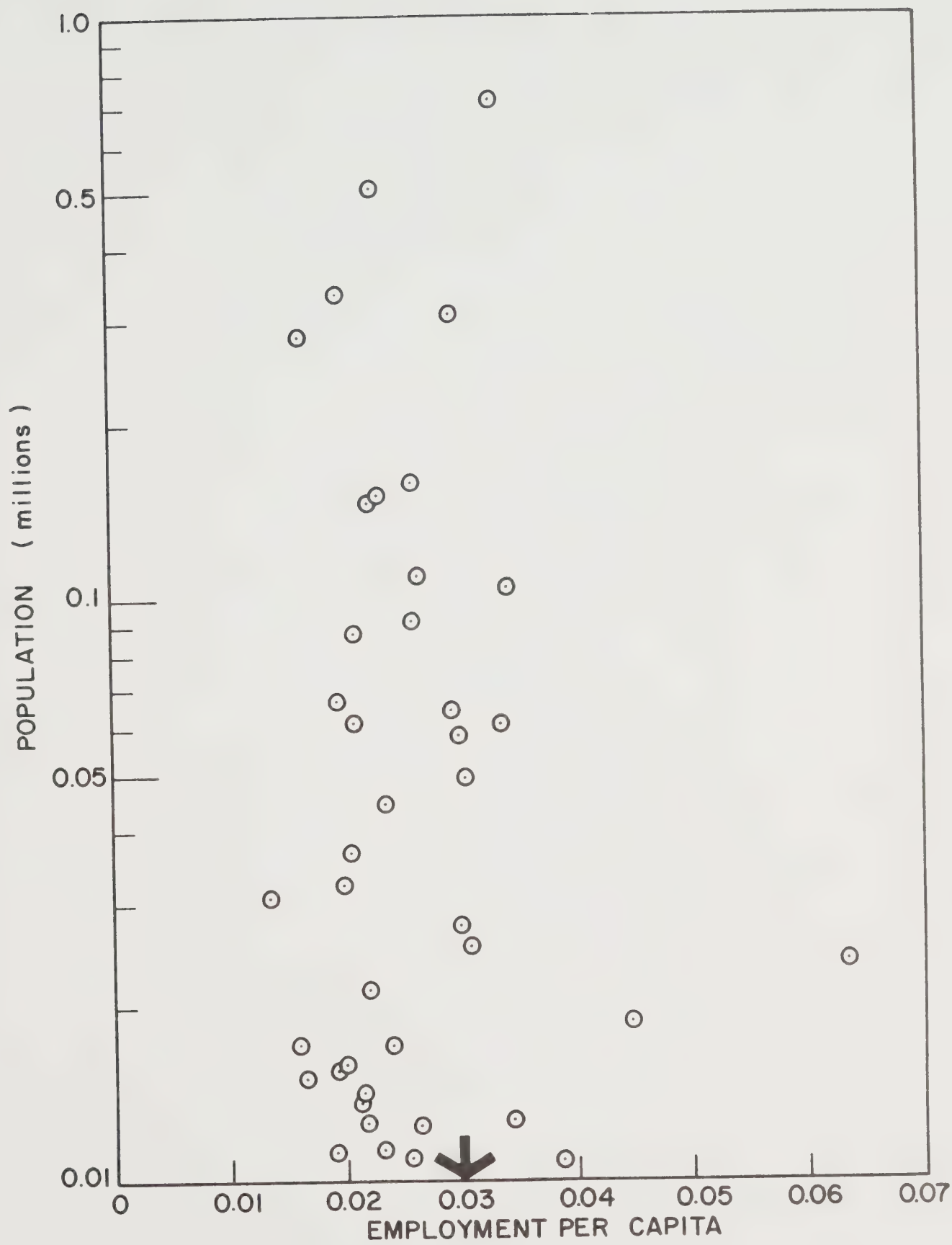


FIGURE B.9 POPULATION vs HEALTH & WELFARE EMPLOYMENT PER CAPITA



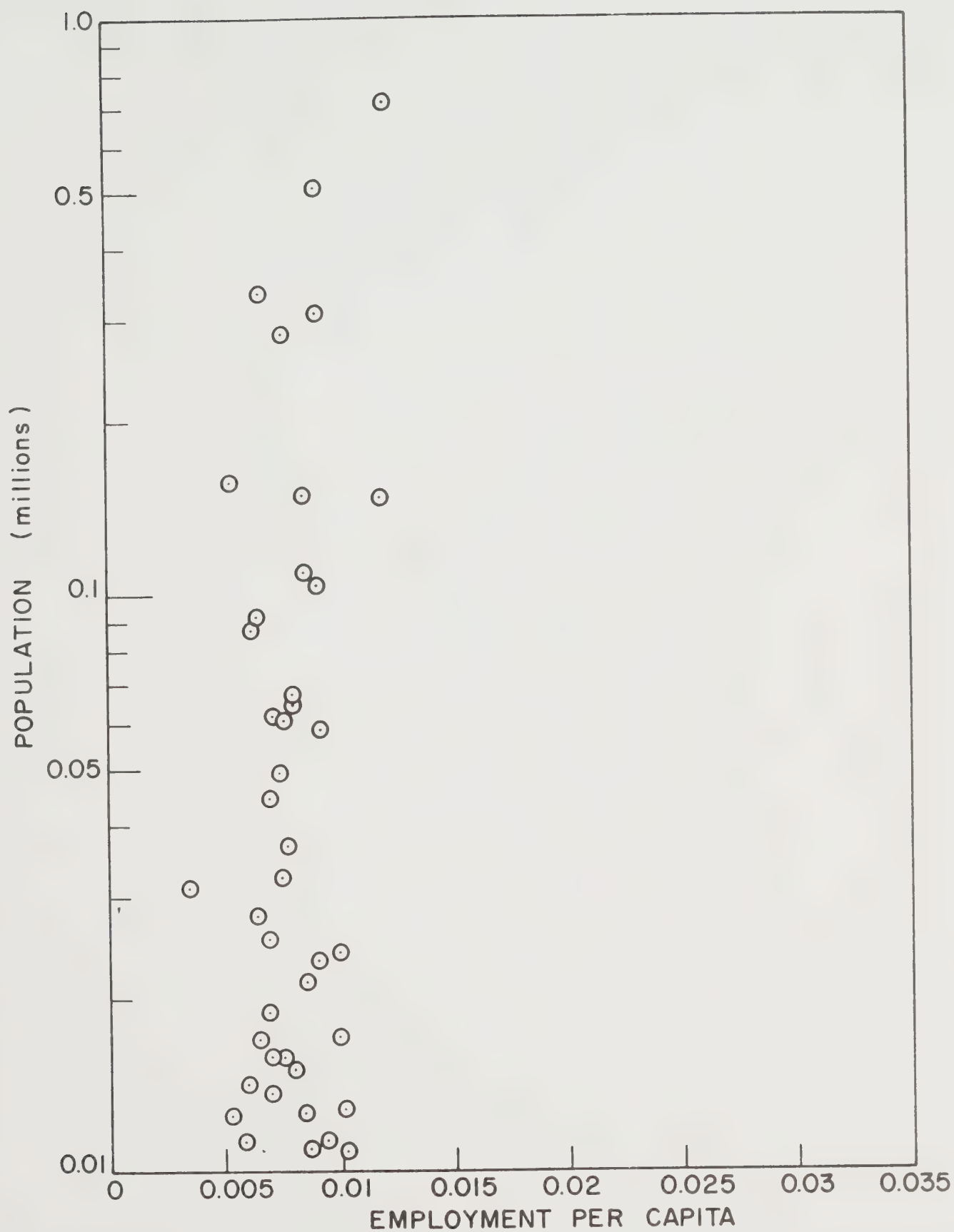


FIGURE B.10 - POPULATION vs PERSONAL SERVICES PER CAPITA



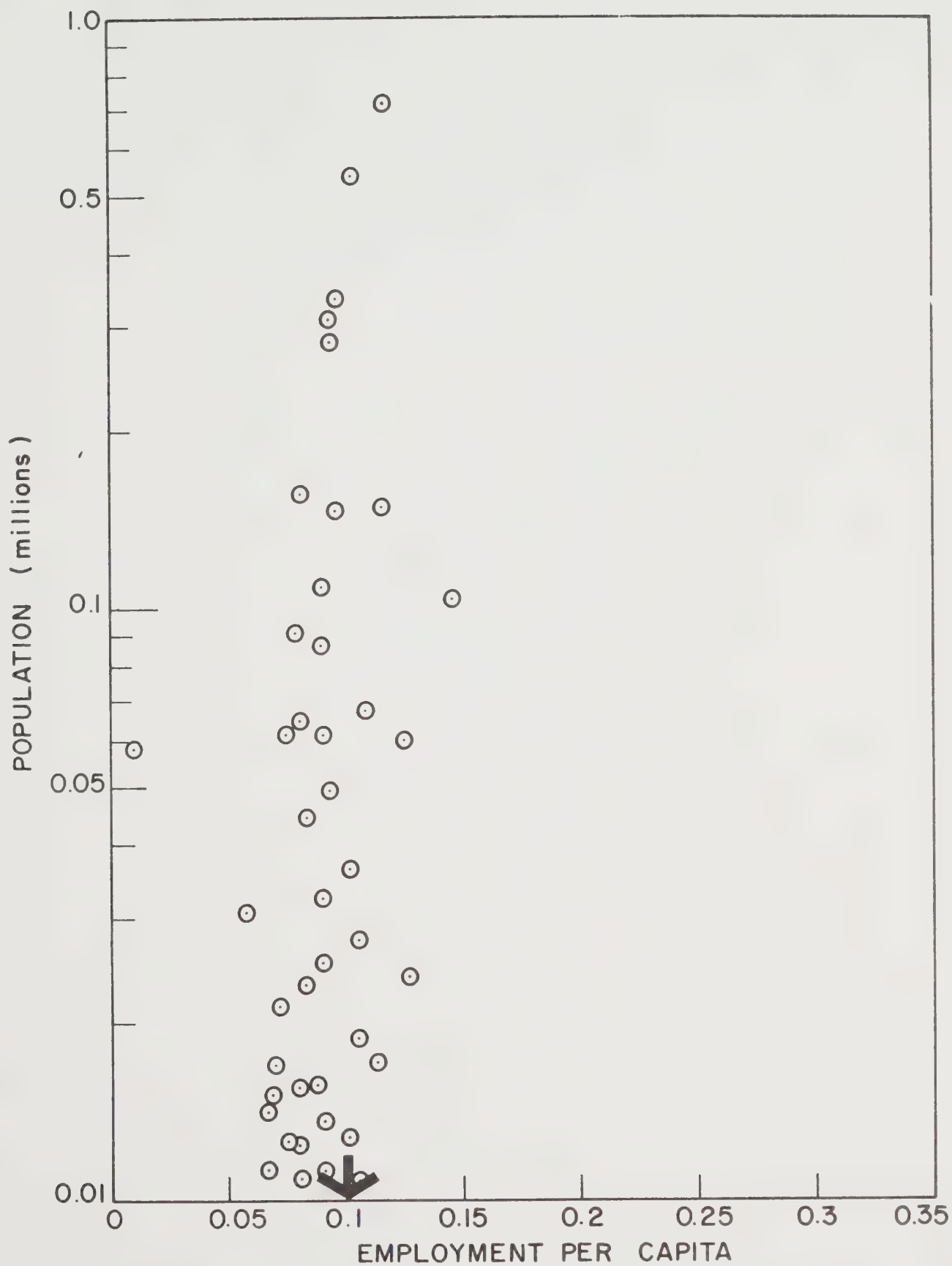


FIGURE B.II POPULATION vs SERVICE EMPLOYMENT PER CAPITA



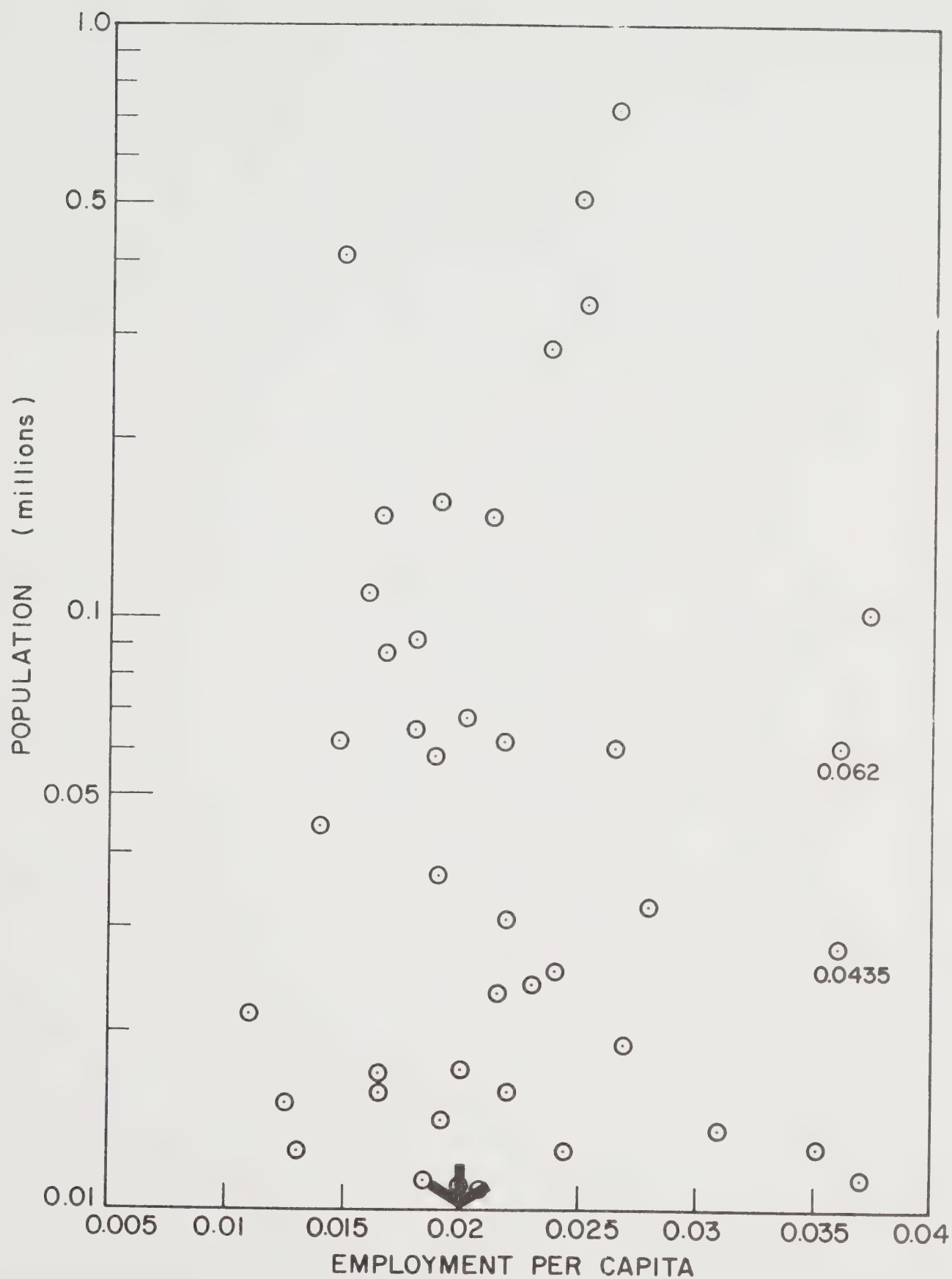


FIGURE B.12 - POPULATION vs PUBLIC ADMINISTRATION EMPLOYMENT PER CAPITA



## APPENDIX C - LAND USE MODEL OUTPUT SUMMARIES

### C.1 INTRODUCTION

Tables C.1 to C.20 contain summaries of the population and employment allocations to urban places within the COLUC Region for the twenty alternative development strategies identified in Table No. 6 of the main report. These allocations are summarized for the five principal sub-regions of the COLUC Region in these tables.



Table C.1 - Model Output for Strategy 1

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,351,425	461,280	592,720	475,573	1,054,000	936,853
Aur-New	44,000	18,673	8,180	10,520	4,043	18,700	12,223
Rich Hill	47,000	32,232	8,740	11,230	6,989	19,980	15,729
Woodbridge	7,000	6,324	1,300	1,670	1,264	2,980	2,564
Markham	21,000	16,094	3,910	5,020	3,225	8,920	7,135
Sub-Region	119,000	73,323	22,130	28,440	15,521	50,580	37,651
Mississauga	280,000	340,987	52,080	66,920	115,322	119,000	167,402
Oakville	105,000	101,629	19,530	25,090	23,866	44,620	43,396
Erin Mills	60,000	65,720	11,160	14,340	18,703	25,500	29,863
N. Oakville	4,000	4,277	740	960	1,764	1,700	2,504
Bramp-Bramal	125,000	132,913	23,250	29,880	37,232	53,130	60,482
Malton	25,000	28,081	4,650	5,980	7,720	10,620	12,370
Georgetown	26,000	20,540	4,840	6,210	7,537	11,050	12,377
Sub-Region	625,000	694,147	116,250	149,380	212,144	265,620	328,394
Hamilton	475,000	553,866	88,350	113,530	160,522	201,880	248,872
Burlington	105,000	99,248	19,530	25,090	21,412	44,620	40,942
N. Burling	2,000	2,069	370	480	510	850	880
Milton	13,000	9,929	2,420	3,110	1,730	5,520	4,150
Sub-Region	595,000	665,112	110,670	142,210	184,174	252,870	294,844
Airport							
Oshawa	180,000	211,639	33,480	43,020		76,500	94,552
N. Pickering	34,000	27,686	6,320	8,130	61,072	14,450	12,094
S. Pickering	40,000	41,209	7,440	9,560	5,774	17,000	17,856
Ajax	34,000	45,543	6,320	8,130	10,416	14,450	24,367
Columbus	1,000	1,218	190	240	18,047	420	574
Bowmanville	15,000	11,438	2,790	3,580	384	6,380	4,916
Audley	6,000	6,366	1,120	1,430	2,126	2,550	2,746
Sub-Region	310,000	345,099		74,090	1,626	131,750	157,105
Urban COLUC	4,129,000	4,129,106	767,990	986,030	99,445	1,754,820	1,754,847



Table C.2 - Model Output for Strategy 2

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,373,364	461,280	592,720	472,206	1,054,000	933,486
Aur-New	44,000	18,726	8,180	10,520	4,074	18,700	12,254
Rich Hill	47,000	32,854	8,740	11,230	7,121	19,980	15,861
Woodbridge	7,000	6,346	1,300	1,670	1,272	2,980	2,572
Markham	21,000	17,989	3,910	5,020	3,589	8,920	7,499
Sub-Region	119,000	75,915	22,130	28,440	16,056	50,580	38,186
Mississauga	280,000	341,343	52,080	66,920	115,432	119,000	167,512
Oakville	105,000	101,755	19,530	25,090	23,930	44,620	43,460
Erin Mills	60,000	65,792	11,160	14,340	18,742	25,500	29,902
N. Oakville	4,000	4,282	740	960	1,767	1,700	2,507
Bramp-Bramal	125,000	133,963	23,250	29,880	37,316	53,130	60,566
Malton	25,000	28,124	4,650	5,980	7,738	10,620	12,388
Georgetown	26,000	20,572	4,840	6,210	7,564	11,050	12,404
Sub-Region	625,000	694,931	116,250	149,380	212,489	265,620	328,739
Hamilton	475,000	554,437	88,350	113,530	160,815	201,880	249,165
Burlington	105,000	99,374	19,530	25,090	21,474	44,620	41,004
N. Burling	2,000	2,072	370	480	511	850	881
Milton	13,000	9,944	2,420	3,110	1,737	5,520	4,157
Sub-Region	595,000	665,827	110,670	142,210	184,537	252,870	295,207
Airport	0	0	22,000	0	0	22,000	22,000
Oshawa	180,000	215,488	33,480	43,020	62,408	76,500	95,888
N. Pickering	34,000	44,154	6,320	8,130	7,087	14,450	13,407
S. Pickering	40,000	44,050	7,440	9,560	11,322	17,000	18,762
Ajax	34,000	47,684	6,320	8,130	19,199	14,450	25,519
Columbus	1,000	1,364	190	240	448	420	638
Bowmanville	15,000	11,485	2,790	3,580	2,151	6,380	4,941
Audley	6,000	6,630	1,120	1,430	1,685	2,550	2,805
Sub-Region	310,000	370,855	79,660	74,090	104,300	153,750	183,960
Urban COLUC	4,129,000	4,180,892	789,990	986,830	989,588	1,776,820	1,779,578



Table C.3 - Model Output for Strategy 3

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,379,942	461,280	592,720	480,050	1,054,000	941,330
Aur-New	44,000	18,657	8,180	10,520	4,044	18,700	12,224
Rich Hill	47,000	32,999	8,740	11,230	7,088	19,970	15,828
Woodbridge	7,000	6,738	1,300	1,670	1,295	2,980	2,595
Markham	21,000	17,589	3,900	5,020	3,763	8,980	7,673
Sub-Region	119,000	75,983	22,130	28,440	16,190	50,570	38,320
Mississauga	289,000	346,725	52,080	66,920	117,193	119,000	169,273
Oakville	105,000	101,834	19,530	25,090	23,931	44,620	43,461
Erin Mills	60,000	67,283	11,160	14,340	19,114	25,500	30,274
N. Oakville	4,000	4,311	740	960	1,774	1,700	2,514
Bramp-Bramal	125,000	140,898	23,250	29,880	38,555	53,130	61,805
Malton	25,000	29,668	26,650	5,980	7,995	32,630	34,645
Georgetown	26,000	20,914	4,840	6,210	7,710	11,050	12,550
Sub-Region	625,000	711,633	138,250	149,380	216,272	287,630	345,810
Hamilton	475,000	553,095	88,350	113,530	160,188	201,880	248,538
Burlington	105,000	99,118	19,530	25,090	21,397	44,620	40,927
N. Burling	2,000	2,075	370	480	511	850	881
Milton	13,000	10,048	2,420	3,111	1,751	5,520	4,171
Sub-Region	595,000	664,337	110,670	142,210	183,847	252,870	294,517
Airport	0	0	0	0	0	0	0
Oshawa	180,000	211,175	33,480	43,020	60,541	76,500	94,021
N. Pickering	80,000	75,289	14,880	19,120	18,866	34,000	33,746
S. Pickering	40,000	42,894	7,440	9,560	11,295	17,000	18,735
Ajax	34,000	46,464	6,320	8,130	18,887	14,450	25,207
Columbus	1,000	1,318	190	240	492	420	682
Bowmanville	15,000	11,358	2,790	3,580	2,112	6,380	4,902
Audley	6,000	6,483	1,120	1,430	1,668	2,550	2,788
Sub-Region	360,000	394,981	66,220	85,080	113,861	151,300	180,081
Urban COLUC	4,179,000	4,226,876	798,550	997,830	1,010,220	1,796,380	1,800,058



Table C.4 - Model Output for Strategy 4

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,366,684	461,280	592,720	478,672	1,054,000	939,952
Aur-New	44,000	18,608	8,180	10,520	4,028	18,700	12,208
Rich Hill	47,000	32,918	8,740	11,230	7,098	19,980	15,838
Woodbridge	7,000	6,320	1,300	1,670	1,260	2,980	2,560
Markham	21,000	18,813	3,910	5,020	4,136	8,920	8,046
Sub-Region	119,000	76,659	22,130	28,440	16,522	50,580	38,652
Mississauga	280,000	339,986	52,080	66,920	114,660	119,000	166,740
Oakville	105,000	101,366	19,530	25,090	23,781	44,620	43,311
Erin Mills	60,000	65,541	11,160	14,340	18,626	25,500	29,786
N. Oakville	4,000	4,266	740	960	1,759	1,700	2,499
Bramp-Bramal	125,000	132,532	23,250	29,880	37,071	53,130	60,321
Malton	25,000	28,004	4,650	5,980	7,671	10,630	12,321
Georgetown	26,000	20,485	4,840	6,210	7,515	11,050	12,355
Sub-Region	625,000	692,180	116,250	149,380	211,083	265,630	327,333
Hamilton	475,000	552,569	88,350	113,530	159,923	201,880	248,273
Burlington	105,000	99,001	19,530	25,090	21,341	44,620	40,871
N. Burling	2,000	2,064	370	480	508	850	878
Milton	13,000	9,903	2,420	3,110	1,725	5,520	4,145
Sub-Region	595,000	663,537	110,670	142,210	183,497	252,870	294,167
Airport	0	0	22,000	0	0	22,000	22,000
Oshawa	180,000	213,513	33,480	43,020	61,261	76,500	94,741
N. Pickering	80,000	102,174	14,880	10,120	22,905	34,000	37,785
S. Pickering	40,000	44,794	7,440	9,560	12,065	17,000	19,505
Ajax	34,000	47,895	6,320	8,130	19,725	14,450	26,045
Columbus	1,000	1,418	190	240	566	420	756
Bowmanville	15,000	11,362	2,790	3,580	2,118	6,380	4,908
Audley	6,000	6,655	1,120	1,430	1,715	2,550	2,835
Sub-Region	360,000	427,811	88,220	85,080	120,355	173,300	208,575
Urban COLUC	4,179,000	4,101,498	798,550	997,830	1,010,129	1,796,380	1,824,058



Table C.5 - Model Output for Strategy 5

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,292,853	461,280	592,720	574,320	1,054,000	1,035,600
Aur-New	44,000	30,374	8,180	10,520	5,899	18,700	14,079
Rich Hill	47,000	40,095	8,740	11,230	6,207	19,980	14,947
Woodbridge	7,000	6,357	1,300	1,670	1,027	2,980	2,327
Markham	21,000	16,267	3,910	5,020	2,409	8,920	6,319
Sub-Region	119,000	93,093	22,130	28,440	15,542	50,580	37,672
Mississauga	280,000	363,849	52,080	66,920	93,583	119,000	145,663
Oakville	105,000	102,373	19,530	25,090	16,851	44,620	36,381
Erin Mills	60,000	68,880	11,160	14,340	13,934	25,500	25,094
N. Oakville	4,000	5,012	740	960	1,886	1,700	2,626
Bramp-Bramal	125,000	141,573	23,250	29,880	27,841	53,130	51,091
Malton	25,000	29,526	4,650	5,980	6,267	10,620	10,917
Georgetown	26,000	21,971	4,840	6,210	5,583	11,050	6,067
Sub-Region	625,000	733,184	116,250	149,380	165,945	265,620	277,839
Hamilton	475,000	550,594	88,350	113,530	139,231	201,880	277,851
Burlington	105,000	94,990	19,530	25,090	15,756	44,620	35,286
N. Burling	2,000	2,091	370	480	511	850	881
Milton	13,000	9,276	2,420	3,110	1,169	5,520	3,589
Sub-Region	595,000	656,951	110,670	142,210	156,667	252,870	267,337
Airport							
Oshawa	180,000	217,687	33,480	43,020	47,029	76,500	80,509
N. Pickering	34,000	27,521	6,320	8,130	3,515	14,450	9,835
S. Pickering	40,000	40,714	7,440	9,560	7,640	17,000	15,080
Ajax	34,000	48,462	6,320	8,130	13,214	14,450	19,534
Columbus	1,000	1,298	190	240	295	420	485
Bowmanville	15,000	10,873	2,790	3,580	1,405	6,380	4,195
Audley	6,000	6,470	1,120	1,430	1,281	2,550	2,401
Sub-Region	310,000	353,025	57,660	74,090	74,379	131,750	132,039
Urban COLUC	4,129,000	4,129,106	767,990	986,030	986,853	1,754,820	1,750,487



Table C.6 - Model Output for Strategy 6

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,308,138	461,280	592,720	581,429	1,054,000	1,042,709
Aur-New	44,000	30,392	8,180	10,520	5,901	18,700	14,081
Rich Hill	47,000	40,489	8,740	11,230	6,342	19,980	15,082
Woodbridge	7,000	6,366	1,300	1,670	1,031	2,980	2,331
Markham	21,000	18,210	3,900	5,020	2,838	8,920	6,748
Sub-Region	119,000	95,457	22,130	28,440	16,112	50,580	38,242
Mississauga	280,000	363,966	52,080	66,920	93,643	119,000	145,723
Oakville	105,000	102,416	19,530	25,090	16,867	44,620	36,397
Erin Mills	60,000	68,905	11,160	14,340	13,945	25,500	25,105
N. Oakville	4,000	5,013	740	960	1,886	1,700	2,626
Brampton-Bramal	125,000	141,625	23,250	29,880	27,863	53,130	51,113
Malton	25,000	29,542	4,650	5,980	6,275	10,620	10,925
Georgetown	26,000	21,982	4,840	6,210	5,589	11,050	10,429
Sub-Region	625,000	733,449	116,250	149,380	166,068	265,620	282,318
Hamilton	475,000	550,794	88,350	113,530	139,324	201,880	227,674
Burlington	105,000	95,034	19,530	25,090	15,772	44,620	35,302
N. Burling	2,000	2,092	370	480	512	850	882
Milton	13,000	9,281	2,420	3,110	1,171	5,520	3,591
Sub-Region	595,000	657,201	110,670	142,210	156,779	252,870	267,449
Airport	0	0	22,000	0	0	22,000	22,000
Oshawa	180,000	220,439	33,480	43,020	48,020	76,500	81,500
N. Pickering	34,000	53,207	6,320	8,130	4,798	14,450	11,118
S. Pickering	40,000	43,455	7,440	9,560	8,550	17,000	15,990
Ajax	34,000	50,468	6,320	8,130	14,332	14,450	20,652
Columbus	1,000	1,467	190	240	371	420	561
Bowmanville	15,000	10,894	2,790	3,580	1,421	6,380	4,211
Audley	6,000	6,696	1,120	1,430	1,345	2,550	2,465
Sub-Region	310,000	386,626	79,660	74,090	78,837	153,750	158,497
Urban COLUC	4,129,000	4,180,871	789,990	986,830	999,225	1,776,820	1,789,215



Table C.7 - Model Output for Strategy 7

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,315,624	461,280	592,720	582,693	1,054,000	1,043,973
Aur-New	44,000	30,229	8,180	10,520	5,856	18,700	14,036
Rich Hill	47,000	40,477	8,740	11,230	6,316	19,970	15,056
Woodbridge	7,000	6,911	1,300	1,670	1,075	2,980	2,375
Markham	21,000	17,832	3,900	5,020	2,884	8,980	6,794
Sub-Region	119,000	95,449	22,130	28,440	16,131	50,570	38,261
Mississauga	280,000	369,840	52,080	66,920	95,644	119,000	147,724
Oakville	105,000	102,442	19,530	25,090	16,903	44,620	36,433
Erin Mills	60,000	70,605	11,160	14,340	14,367	25,500	25,527
N. Oakville	4,000	5,038	740	960	1,882	1,700	2,622
Bramp-Bramal	125,000	152,855	23,250	29,880	29,380	53,130	52,630
Malton	25,000	31,762	26,650	5,980	6,654	32,630	33,304
Georgetown	26,000	22,311	4,840	6,210	5,780	11,050	10,620
Sub-Region	625,000	754,853	138,250	149,380	170,610	287,630	308,860
Hamilton	475,000	549,686	88,350	113,530	139,019	201,880	227,369
Burlington	105,000	94,821	19,530	25,090	15,745	44,620	35,275
N. Burling	2,000	2,094	370	480	511	850	881
Milton	13,000	9,372	2,420	3,111	1,191	5,520	3,611
Sub-Region	595,000	655,973	110,670	142,310	156,466	252,870	267,136
Airport	0	0	0	0	0	0	0
Oshawa	180,000	216,703	33,480	43,020	46,472	76,500	79,952
N. Pickering	80,000	77,740	14,880	19,120	12,111	34,000	26,991
S. Pickering	40,000	42,380	7,440	9,560	8,467	17,000	15,907
Ajax	34,000	49,340	6,320	8,130	14,158	14,450	20,478
Columbus	1,000	1,428	190	240	403	420	593
Bowmanville	15,000	10,801	2,790	3,580	1,386	6,380	4,176
Audley	6,000	6,579	1,120	1,430	1,324	2,550	2,444
Sub-Region	360,000	404,971	66,220	85,080	84,321	151,300	150,541
Urban COLUC	4,179,000	4,226,870	798,550	997,830	1,010,221	1,796,380	1,808,771



Table C.8 - Model Output for Strategy 8

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,298,736	461,280	592,720	581,158	1,054,000	1,042,438
Aur-New	44,000	30,202	8,180	10,520	5,846	18,700	14,026
Rich Hill	47,000	40,314	8,740	11,230	6,357	19,980	15,097
Woodbridge	7,000	6,337	1,300	1,670	1,027	2,980	2,327
Markham	21,000	18,934	3,900	5,020	3,315	8,980	7,225
Sub-Region	119,000	95,787	22,130	28,440	16,545	50,580	38,675
Mississauga	280,000	362,924	52,080	66,920	93,354	119,000	145,434
Oakville	105,000	102,128	19,530	25,090	16,817	44,620	36,347
Erin Mills	60,000	68,717	11,160	14,340	13,904	25,500	25,064
N. Oakville	4,000	5,001	740	960	1,879	1,700	2,619
Brampton-Bramal	125,000	141,212	23,250	29,880	27,773	53,130	51,023
Malton	25,000	29,916	4,650	5,980	6,252	10,630	10,902
Georgetown	26,000	21,916	4,840	6,210	5,573	11,050	10,413
Sub-Region	625,000	731,335	116,250	149,380	165,552	265,630	281,802
Hamilton	475,000	549,393	88,350	113,530	138,960	201,880	227,310
Burlington	105,000	94,757	19,530	25,090	15,728	44,620	35,258
N. Burling	2,000	2,086	370	480	510	850	880
Milton	13,000	9,251	2,420	3,111	1,168	5,520	3,588
Sub-Region	595,000	655,487	110,670	142,210	156,366	252,870	267,036
Airport	0	0	22,000	0	0	22,000	22,000
Oshawa	180,000	218,194	33,480	43,020	47,072	76,500	80,552
N. Pickering	80,000	113,803	14,880	19,120	15,932	34,000	30,812
S. Pickering	40,000	43,981	7,440	9,560	9,284	17,000	16,724
Ajax	34,000	50,510	6,320	8,130	15,036	14,450	21,356
Columbus	1,000	1,528	190	240	499	420	689
Bowmanville	15,000	10,801	2,790	3,580	1,395	6,380	4,185
Audley	6,000	6,709	1,120	1,430	1,381	2,550	2,501
Sub-Region	360,000	445,526	88,220	85,080	90,599	173,300	178,819
Urban COLUC	4,179,000	4,226,871	798,550	997,830	1,010,220	1,796,380	1,808,770



Table C.9 - Model Output for Strategy 9

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,397,301	423,000	854,000	668,134	1,277,000	1,091,134
Aur-New	44,000	19,299	6,400	18,600	8,213	25,000	14,613
Rich Hill	47,000	30,828	4,800	8,200	5,768	13,000	10,568
Woodbridge	7,000	6,062	2,300	1,700	1,471	4,000	3,771
Markham	21,000	15,663	3,100	2,900	2,127	6,000	5,227
Sub-Region	119,000	71,852	16,600	31,400	17,579	48,000	34,179
Mississauga	280,000	332,720	46,100	86,900	144,674	133,000	190,774
Oakville	105,000	96,352	20,400	27,600	29,358	48,000	49,758
Erin Mills	60,000	57,209	4,200	4,800	6,863	9,000	11,063
N. Oakville	4,000	3,556	400	600	1,171	1,000	1,571
Bramp-Bramal	125,000	121,595	18,300	18,700	26,218	37,000	44,518
Malton	25,000	26,383	22,600	19,400	26,644	42,000	49,244
Georgetown	26,000	17,580	3,200	3,800	3,858	7,000	7,058
Sub-Region	625,000	655,395	115,200	161,800	238,786	277,000	353,986
Hamilton	475,000	565,342	101,300	148,700	213,303	250,000	314,603
Burlington	105,000	99,248	13,400	25,600	23,939	39,000	37,339
N. Burling	2,000	1,841	0	0	0	0	0
Milton	13,000	8,664	1,000	2,000	1,438	3,000	2,438
Sub-Region	595,000	675,095	115,700	176,300	238,680	292,000	354,380
Airport							
Oshawa	180,000	202,287	41,800	49,200	80,013	91,000	121,813
N. Pickering	34,000	27,916	5,000	20,000	16,479	25,000	21,479
S. Pickering	40,000	37,797	1,800	8,200	10,102	10,000	11,902
Ajax	34,000	42,980	4,900	5,100	11,519	10,000	16,419
Columbus	1,000	1,239	0	0	0	0	0
Bowmanville	15,000	10,756	1,500	2,500	1,867	4,000	3,367
Audley	6,000	6,387	300	700	959	1,000	1,259
Sub-Region	310,000	329,362	55,300	85,700	120,939	141,000	176,239
Urban COLUC	4,129,000	4,129,005	725,800	1,309,200	1,284,118	2,035,000	2,009,918



Table C.10 - Model Output for Strategy 10

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,399,954	423,000	854,000	670,459	1,277,000	1,093,459
Aur-New	44,000	19,205	6,400	18,600	8,196	25,000	14,596
Rich Hill	47,000	31,152	4,800	8,200	5,846	13,000	10,646
Woodbridge	7,000	6,048	2,300	1,700	1,469	4,000	3,769
Markham	21,000	17,206	3,100	2,900	2,554	6,000	5,654
Sub-Region	119,000	73,611	16,600	31,400	18,065	48,000	34,665
Mississauga	280,000	331,520	46,100	86,900	144,084	133,000	190,184
Oakville	105,000	96,034	20,400	27,600	29,268	48,000	49,668
Erin Mills	60,000	57,016	4,200	4,800	6,839	9,000	11,039
N. Oakville	4,000	3,544	400	600	1,168	1,000	1,568
Bramp-Bramal	125,000	121,177	18,300	18,700	26,125	37,000	44,425
Malton	25,000	26,290	22,600	19,400	26,540	42,000	49,140
Georgetown	26,000	17,517	3,200	3,800	3,845	7,000	7,045
Sub-Region	625,000	653,098	115,200	161,800	237,869	277,000	353,069
Hamilton	475,000	563,659	101,300	148,700	212,655	250,000	313,955
Burlington	105,000	98,931	13,400	25,600	23,872	39,000	37,272
N. Burling	2,000	1,835	0	0	0	0	0
Milton	13,000	8,633	1,000	2,000	1,434	3,000	2,434
Sub-Region	595,000	673,058	115,700	176,300	237,961	292,000	353,661
Airport	0	0	0	0	0	0	0
Oshawa	180,000	202,287	41,800	49,200	80,510	91,000	122,310
N. Pickering	80,000	76,668	25,800	24,880	29,318	50,680	55,118
S. Pickering	40,000	39,766	1,800	8,200	11,128	10,000	12,928
Ajax	34,000	44,136	4,900	5,100	12,164	10,000	17,064
Columbus	1,000	1,349	0	0	0	0	0
Bowmanville	15,000	10,663	1,500	2,500	1,860	4,000	3,360
Audley	6,000	6,520	300	700	994	1,000	1,294
Sub-Region	356,000	381,389	76,100	90,580	135,974	141,000	212,074
Urban COLUC	4,175,000	4,181,110	746,600	1,314,080	1,300,328	2,060,680	2,046,928



Table C.11 - Model Output for Strategy 11

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,349,256	423,000	854,000	761,000	1,277,000	1,184,000
Aur-New	44,000	32,386	6,400	18,600	10,421	25,000	16,821
Rich Hill	47,000	37,188	4,800	8,200	5,726	13,000	10,526
Woodbridge	7,000	6,135	2,300	1,700	1,365	4,000	3,665
Markham	21,000	15,432	3,100	2,900	1,913	6,000	5,013
Sub-Region	119,000	91,141	16,600	31,400	19,425	48,000	36,025
Mississauga	280,000	352,986	46,100	86,900	123,174	133,000	169,274
Oakville	105,000	96,158	20,400	27,600	21,842	48,000	42,242
Erin Mills	60,000	57,421	4,200	4,800	5,457	9,000	9,657
N. Oakville	4,000	3,974	400	600	1,168	1,000	1,568
Bramp-Bramal	125,000	128,025	18,300	18,700	21,022	37,000	39,322
Malton	25,000	27,638	22,600	19,400	23,726	42,000	46,326
Georgetown	26,000	17,463	3,200	3,800	3,056	7,000	6,256
Sub-Region	625,000	683,665	115,200	161,800	199,445	277,000	314,645
Hamilton	475,000	565,556	101,300	148,700	189,279	250,000	290,579
Burlington	105,000	94,902	13,400	25,600	18,243	39,000	31,643
N. Burling	2,000	1,795	0	0	0	0	0
Milton	13,000	7,675	1,000	2,000	1,078	3,000	2,078
Sub-Region	595,000	669,928	115,700	176,300	208,600	292,000	324,300
Airport							
Oshawa	180,000	207,258	41,800	49,200	64,396	91,000	106,196
N. Pickering	34,000	28,462	5,000	20,000	11,668	25,000	16,668
S. Pickering	40,000	36,345	1,800	8,200	8,512	10,000	10,312
Ajax	34,000	45,293	4,900	5,100	9,004	10,000	13,904
Columbus	1,000	1,344	0	0	0	0	0
Bowmanville	15,000	9,801	1,500	2,500	1,287	4,000	2,787
Audley	6,000	6,511	300	700	782	1,000	1,082
Sub-Region	310,000	335,014	55,300	85,700	95,649	141,000	150,949
Urban COLUC	4,129,000	4,129,004	725,800	1,309,200	1,284,119	2,035,000	2,009,919



Table C.12 - Model Output for Strategy 12

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,480,000	2,348,261	423,000	854,000	764,871	1,277,000	1,187,871
Aur-New	44,000	32,213	6,400	18,600	10,372	25,000	16,772
Rich Hill	47,000	37,268	4,800	8,200	5,823	13,000	10,623
Woodbridge	7,000	6,115	2,300	1,700	1,364	4,000	3,664
Markham	21,000	17,065	3,100	2,900	2,345	6,000	5,445
Sub-Region	119,000	92,661	16,600	31,400	19,904	48,000	36,504
Mississauga	280,000	351,977	46,100	86,900	122,846	133,000	168,946
Oakville	105,000	95,904	20,400	27,600	21,795	48,000	42,195
Erin Mills	60,000	57,267	4,200	4,800	5,443	9,000	9,643
N. Oakville	4,000	3,964	400	600	1,164	1,000	1,564
Bramp-Bramal	125,000	127,679	18,300	18,700	20,969	37,000	39,269
Malton	25,000	27,551	22,600	19,400	23,668	42,000	46,268
Georgetown	26,000	17,411	3,200	3,800	3,048	7,000	6,248
Sub-Region	625,000	681,753	115,200	161,800	198,933	277,000	314,133
Hamilton	475,000	564,199	101,300	148,700	188,891	250,000	290,191
Burlington	105,000	94,648	13,400	25,600	18,208	39,000	31,608
N. Burling	2,000	1,790	0	0	0	0	0
Milton	13,000	7,650	1,000	2,000	1,076	3,000	2,076
Sub-Region	595,000	668,287	115,700	176,300	208,175	292,000	323,875
Airport	0	0	0	0	0	0	0
Oshawa	180,000	206,833	41,800	49,200	64,985	91,000	106,785
N. Pickering	80,000	80,711	25,800	24,880	22,098	50,680	47,898
S. Pickering	40,000	38,326	1,800	8,200	9,554	10,000	11,354
Ajax	34,000	46,431	4,900	5,100	9,703	10,000	14,603
Columbus	1,000	1,482	0	0	0	0	0
Bowmanville	15,000	9,727	1,500	2,500	1,281	4,000	2,781
Audley	6,000	6,635	300	700	820	1,000	1,120
Sub-Region	356,000	390,145	76,100	90,580	108,441	141,000	184,541
Urban COLUC	4,175,000	4,181,107	746,600	1,314,080	1,300,324	2,060,680	2,046,924



Table C.13 - Model Output for Strategy 13

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,593,000	2,539,121	417,992	930,368	599,797	1,348,360	1,017,789
Aur-New	55,000	24,449	6,173	15,115	5,477	21,288	11,650
Rich Hill	45,000	29,241	5,052	12,368	7,036	17,420	12,088
Woodbridge	6,000	4,810	674	1,649	1,073	2,323	1,747
Markham	18,000	12,894	2,021	4,948	2,763	6,969	4,784
Sub-Region	124,000	71,394	13,920	34,080	16,349	48,000	30,269
Mississauga	225,000	249,452	31,909	56,726	88,959	88,635	120,868
Oakville	66,000	54,277	10,048	15,177	11,616	25,225	21,664
Erin Mills	54,000	49,354	8,218	12,414	14,403	20,632	22,621
N. Oakville	1,000	851	154	232	352	386	506
Bramp-Bramal	92,000	82,395	14,003	21,152	23,803	35,155	37,806
Malton	18,000	17,695	2,738	4,136	4,796	6,874	7,534
Georgetown	22,000	15,051	3,351	5,062	3,486	8,413	6,837
Sub-Region	478,000	469,075	70,421	114,899	147,415	185,320	217,836
Hamilton	415,000	470,348	82,640	118,922	151,163	201,562	233,803
Burlington	100,000	85,823	8,635	22,899	17,354	31,534	25,989
N. Burling	1,000	866	86	229	212	315	298
Milton	9,000	5,944	777	2,062	974	2,839	1,751
Sub-Region	525,000	563,031	92,138	144,112	169,703	236,250	261,841
Airport							
Oshawa	300,000	376,414	49,647	100,797	135,515	150,444	185,162
N. Pickering	30,000	23,108	4,830	8,971	5,546	13,801	10,376
S. Pickering	58,000	57,433	9,430	12,578	13,000	22,008	22,430
Ajax	24,000	33,784	3,902	5,203	13,096	9,106	16,998
Columbus	1,000	1,292	163	217	342	380	505
Bowmanville	15,000	11,783	2,439	3,254	1,586	5,693	4,025
Audley	3,000	3,541	488	651	715	1,139	1,203
Sub-Region	431,000	507,355	70,899	131,671	169,800	202,570	240,699
Urban COLUC	4,151,000	4,149,976	665,370	1,355,130	1,103,064	2,020,500	1,768,434



Table C.14 - Model Output for Strategy 14

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,593,000	2,558,545	417,992	930,368	605,329	1,348,360	1,023,321
Aur-New	55,000	24,505	6,173	15,115	5,508	21,288	11,681
Rich Hill	45,000	29,745	5,052	12,368	7,152	17,420	12,204
Woodbridge	6,000	4,826	674	1,649	1,078	2,323	1,752
Markham	18,000	14,270	2,021	4,948	3,047	6,969	5,068
Sub-Region	124,000	73,346	13,920	34,080	16,785	48,000	30,705
Mississauga	225,000	249,681	31,909	56,726	89,007	88,635	120,916
Oakville	66,000	54,345	10,048	15,177	11,644	25,225	21,692
Erin Mills	54,000	49,409	8,218	12,414	14,427	20,632	22,645
N. Oakville	1,000	852	154	232	352	386	506
Bramp-Bramal	92,000	82,489	14,003	21,152	23,846	35,155	37,849
Malton	18,000	17,721	2,738	4,136	4,805	6,874	7,543
Georgetown	22,000	15,073	3,351	5,062	3,494	8,413	6,847
Sub-Region	478,000	469,570	70,421	114,899	147,577	185,320	217,998
Hamilton	415,000	470,771	82,640	118,922	151,382	201,562	234,022
Burlington	100,000	85,925	8,635	22,899	17,396	31,534	26,031
N. Burling	1,000	867	86	229	213	315	299
Milton	9,000	6,003	777	2,062	977	2,839	1,754
Sub-Region	525,000	563,566	92,138	144,112	169,968	236,250	262,106
Airport	0	0	22,000	0	0	22,000	22,000
Oshawa	300,000	381,849	49,647	100,797	138,040	150,444	187,687
N. Pickering	30,000	35,415	4,830	8,971	6,672	13,801	11,502
S. Pickering	58,000	60,921	9,430	12,578	14,072	22,008	23,502
Ajax	24,000	35,064	3,902	5,203	13,900	9,106	17,802
Columbus	1,000	1,416	163	217	393	380	556
Bowmanville	15,000	11,822	2,439	3,254	1,603	5,693	4,042
Audley	3,000	3,652	488	631	737	1,139	1,225
Sub-Region	431,000	530,139	92,899	131,671	175,417	224,570	268,316
Urban COLUC	4,151,000	4,195,166	687,370	1,355,130	1,115,076	2,042,500	1,802,446



Table C.15 - Model Output for Strategy 15

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,593,000	2,565,853	417,992	930,368	602,952	1,348,360	1,020,944
Aur-New	55,000	24,409	6,173	15,115	17,322	21,288	23,495
Rich Hill	40,000	29,945	5,052	12,368	7,125	17,420	12,177
Woodbridge	6,000	5,140	674	1,649	1,105	2,323	1,779
Markham	18,000	14,161	2,021	4,948	3,297	6,969	5,318
Sub-Region	124,000	73,655	13,920	34,080	28,849	48,000	42,769
Mississauga	225,000	253,586	31,909	56,726	90,520	88,635	122,429
Oakville	66,000	54,383	10,048	15,177	11,643	25,225	21,691
Erin Mills	54,000	50,657	8,218	12,414	14,759	20,632	22,977
N. Oakville	1,000	858	154	232	354	386	508
Bramp-Bramal	92,000	87,859	14,003	21,152	24,747	35,155	38,750
Malton	18,000	18,756	24,738	4,136	4,990	28,874	29,728
Georgetown	22,000	15,339	3,351	5,062	3,567	8,413	6,918
Sub-Region	478,000	481,438	92,421	114,899	150,580	207,320	243,001
Hamilton	415,000	469,426	82,640	118,922	149,693	201,562	232,333
Burlington	100,000	85,668	8,635	22,899	17,322	31,534	25,957
N. Burling	1,000	869	86	229	213	315	299
Milton	9,000	6,069	777	2,062	986	2,839	1,063
Sub-Region	525,000	562,035	92,138	144,112	168,214	236,250	260,352
Airport	0	0	0	0	0	0	0
Oshawa	300,000	376,519	49,647	100,797	135,449	150,444	185,096
N. Pickering	80,000	71,710	12,880	23,920	21,537	36,800	34,417
S. Pickering	58,000	59,991	9,430	12,578	14,265	22,008	23,695
Ajax	24,000	34,490	3,902	5,203	13,865	9,106	17,767
Columbus	1,000	1,394	163	217	460	380	623
Bowmanville	15,000	11,712	2,439	3,254	1,580	5,693	4,019
Audley	3,000	3,603	488	651	742	1,139	1,230
Sub-Region	431,000	559,419	78,949	146,620	187,898	225,569	266,847
Urban COLUC	4,201,000	4,242,400	695,420	1,370,079	1,138,493	2,065,499	1,833,913



Table C.16 - Model Output for Strategy 16

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,593,000	2,551,369	417,992	930,368	599,909	1,348,360	1,017,899
Aur-New	55,000	24,348	6,173	15,115	5,438	21,288	11,611
Rich Hill	45,000	29,831	5,052	12,368	7,119	17,420	12,171
Woodbridge	6,000	4,805	674	1,649	1,067	2,323	1,741
Markham	18,000	15,026	2,021	4,948	3,599	6,969	5,620
Sub-Region	124,000	74,010	13,920	34,080	17,223	48,000	31,143
Mississauga	225,000	248,517	31,909	56,726	88,371	88,635	120,280
Oakville	66,000	54,103	10,048	15,177	11,561	25,225	21,609
Erin Mills	54,000	49,190	8,218	12,414	14,329	20,632	22,547
N. Oakville	1,000	848	154	232	350	386	504
Bramp-Bramal	92,000	82,109	14,003	21,152	23,670	35,155	37,673
Malton	18,000	17,636	2,738	4,136	4,758	6,874	7,496
Georgetown	22,000	15,000	3,351	5,062	3,471	8,413	6,822
Sub-Region	478,000	467,403	70,421	114,899	146,510	185,320	216,931
Hamilton	415,000	468,961	82,640	118,922	150,439	201,562	233,079
Burlington	100,000	85,557	8,635	22,899	17,276	31,534	25,911
N. Burling	1,000	864	86	229	211	315	297
Milton	9,000	5,974	777	2,062	970	2,839	1,747
Sub-Region	525,000	561,356	92,138	144,112	168,896	236,250	261,034
Airport	0	0	22,000	0	0	22,000	22,000
Oshawa	300,000	379,711	49,647	100,797	136,843	150,444	186,489
N. Pickering	80,000	94,090	12,880	23,920	25,773	36,800	38,653
S. Pickering	58,000	62,274	9,430	12,578	15,168	22,008	24,598
Ajax	24,000	35,327	3,902	5,203	14,440	9,106	18,342
Columbus	1,000	1,477	163	217	525	380	688
Bowmanville	15,000	11,712	2,439	3,254	1,584	5,693	4,023
Audley	3,000	3,674	488	651	761	1,139	1,249
Sub-Region	481,000	588,265	100,949	146,620	195,094	247,569	296,042
Urban COLUC	4,201,000	4,242,403	695,420	1,370,079	1,127,632	2,065,499	1,823,049



Table C.17 - Model Output for Strategy 17

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,593,000	2,503,431	417,992	930,368	697,694	1,348,360	1,115,686
Aur-New	55,000	37,182	6,173	15,115	8,516	21,288	14,689
Rich Hill	45,000	34,942	5,052	12,368	6,465	17,420	11,517
Woodbridge	6,000	4,743	674	1,649	926	2,323	1,600
Markham	18,000	12,527	2,021	4,948	2,246	6,969	4,267
Sub-Region	124,000	89,394	13,920	34,080	18,153	48,000	32,073
Mississauga	225,000	264,316	31,909	56,726	69,476	88,635	101,385
Oakville	66,000	52,961	10,048	15,177	7,778	25,225	17,826
Erin Mills	54,000	51,179	8,218	12,414	10,326	20,632	18,544
N. Oakville	1,000	962	154	232	350	386	504
Bramp-Bramal	92,000	86,350	14,003	21,152	17,169	35,155	31,172
Malton	18,000	18,296	2,738	4,136	3,890	6,874	6,628
Georgetown	22,000	15,892	3,351	5,062	2,655	8,413	6,006
Sub-Region	478,000	489,956	70,421	114,899	111,644	185,320	182,065
Hamilton	415,000	471,246	82,640	118,922	133,247	201,562	215,887
Burlington	100,000	81,175	8,635	22,899	12,818	31,534	21,453
N. Burling	1,000	850	86	229	215	315	301
Milton	9,000	5,521	777	2,062	660	2,839	1,437
Sub-Region	525,000	558,792	92,138	144,112	146,940	236,250	239,078
Airport							
Oshawa	300,000	380,641	49,647	100,797	104,447	150,444	154,093
N. Pickering	30,000	22,133	4,830	8,971	3,465	13,801	8,295
S. Pickering	58,000	54,817	9,430	12,578	9,663	22,008	19,093
Ajax	24,000	35,306	3,902	5,203	9,256	9,106	13,158
Columbus	1,000	1,346	163	217	259	380	422
Bowmanville	15,000	10,589	2,439	3,254	1,064	5,693	3,503
Audley	3,000	3,564	488	651	571	1,139	1,059
Sub-Region	431,000	508,405	70,899	131,671	128,725	202,570	199,624
Urban COLUC	4,151,000	4,149,962	665,370	1,355,130	1,103,156	2,020,500	1,768,526



Table C.18 - Model Output for Strategy 18

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,593,000	2,507,471	417,992	930,368	715,542	1,348,360	1,133,534
Aur-New	55,000	37,202	6,173	15,115	8,830	21,288	15,003
Rich Hill	45,000	35,274	5,052	12,368	6,824	17,420	11,876
Woodbridge	6,000	4,750	674	1,649	881	2,323	1,555
Markham	18,000	13,990	2,021	4,948	2,686	6,969	4,707
Sub-Region	124,000	91,216	13,920	34,080	19,221	48,000	33,141
Mississauga	225,000	264,398	31,909	56,726	59,908	88,635	91,817
Oakville	66,000	52,985	10,048	15,177	6,693	25,225	16,741
Erin Mills	54,000	51,198	8,218	12,414	8,430	20,632	16,648
N. Oakville	1,000	963	154	232	307	386	461
Bramp-Bramal	92,000	86,384	14,003	21,152	14,029	35,155	28,032
Malton	18,000	18,307	2,738	4,136	3,434	6,874	6,172
Georgetown	22,000	15,900	3,351	5,062	2,124	8,413	5,475
Sub-Region	478,000	490,135	70,421	114,899	94,925	185,320	165,346
Hamilton	415,000	471,398	82,640	118,922	135,411	201,562	218,051
Burlington	100,000	81,212	8,635	22,899	12,642	31,534	21,277
N. Burling	1,000	851	86	229	206	315	292
Milton	9,000	5,525	777	2,062	585	2,839	1,362
Sub-Region	525,000	558,986	92,138	144,112	148,844	236,250	240,982
Airport	0	0	22,000	0	0	22,000	22,000
Oshawa	300,000	384,673	49,647	100,797	108,629	150,444	158,276
N. Pickering	30,000	42,050	4,830	8,971	4,725	13,801	9,555
S. Pickering	58,000	58,310	9,430	12,578	10,968	22,008	20,398
Ajax	24,000	36,550	3,902	5,203	10,141	9,106	14,043
Columbus	1,000	1,494	163	217	324	380	487
Bowmanville	15,000	10,616	2,439	3,254	1,145	5,693	3,584
Audley	3,000	3,663	488	651	610	1,139	1,098
Sub-Region	431,000	537,356	92,899	131,671	136,542	224,570	229,441
Urban COLUC	4,151,000	4,185,164	687,370	1,355,130	1,115,074	2,042,500	1,802,444



Table C.19 - Model Output for Strategy 19

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,593,000	2,525,783	417,992	930,368	705,864	1,348,360	1,123,856
Aur-New	55,000	37,008	6,173	15,115	8,454	21,288	14,627
Rich Hill	45,000	35,339	5,052	12,368	6,577	17,420	11,629
Woodbridge	6,000	5,198	674	1,649	972	2,323	1,646
Markham	18,000	13,905	2,021	4,948	2,689	6,969	4,710
Sub-Region	124,000	91,450	13,920	34,080	18,692	48,000	32,612
Mississauga	225,000	268,764	31,909	56,726	71,153	88,635	103,062
Oakville	66,000	52,992	10,048	15,177	7,806	25,225	17,854
Erin Mills	54,000	52,654	8,218	12,414	10,693	20,632	18,911
N. Oakville	1,000	969	154	232	349	386	503
Brampton-Bramal	92,000	94,269	14,003	21,152	18,233	35,155	32,236
Malton	18,000	19,831	24,738	4,136	4,162	28,874	28,900
Georgetown	22,000	16,162	3,351	5,062	2,746	8,413	6,097
Sub-Region	478,000	505,641	92,421	114,899	115,142	207,320	207,563
Hamilton	415,000	470,270	82,640	118,922	132,965	201,562	215,605
Burlington	100,000	80,955	8,635	22,899	12,798	31,534	21,433
N. Burling	1,000	851	86	229	214	315	300
Milton	9,000	5,583	777	2,062	674	2,839	1,451
Sub-Region	525,000	557,759	92,138	144,112	146,651	236,250	238,789
Airport	0	0	0	0	0	0	
Oshawa	300,000	380,382	49,647	100,797	104,517	150,444	154,164
N. Pickering	80,000	72,262	12,880	23,920	13,737	36,800	26,617
S. Pickering	58,000	57,490	9,430	12,578	10,831	22,008	20,261
Ajax	24,000	36,048	3,902	5,203	10,164	9,106	14,066
Columbus	1,000	1,481	163	217	373	380	536
Bowmanville	15,000	10,540	2,439	3,254	1,056	5,693	3,495
Audley	3,000	3,628	488	651	600	1,139	1,088
Sub-Region	431,000	561,831	78,949	146,620	141,278	225,569	220,227
Urban COLUC	4,201,000	4,242,464	695,420	1,370,079	1,127,627	2,065,499	1,823,047



Table C.20 - Model Output for Strategy 20

Urban Place	Population		Employment				
	Given	Sim	Basic	Service		Total	
				Given	Sim	Given	Sim
Toronto	2,593,000	2,507,914	417,992	930,368	702,652	1,348,360	1,120,644
Aur-New	55,000	36,974	6,173	15,115	8,439	21,288	14,612
Rich Hill	45,000	35,166	5,052	12,368	6,602	17,420	11,654
Woodbridge	6,000	4,727	674	1,649	925	2,323	1,599
Markham	18,000	14,700	2,021	4,948	3,036	6,969	5,057
Sub-Region	124,000	91,567	13,920	34,080	19,002	48,000	32,922
Mississauga	225,000	263,451	31,909	56,726	69,251	88,635	101,160
Oakville	66,000	52,802	10,048	15,177	7,756	25,225	17,804
Erin Mills	54,000	51,030	8,218	12,414	10,294	20,632	18,512
N. Oakville	1,000	960	154	232	348	386	502
Bramp-Bramal	92,000	86,083	14,003	21,152	17,111	35,155	31,114
Malton	18,000	18,232	2,738	4,136	3,878	6,874	6,616
Georgetown	22,000	15,842	3,351	5,062	2,646	8,413	5,997
Sub-Region	478,000	488,400	70,421	114,899	111,284	185,320	181,705
Hamilton	415,000	470,016	82,640	118,922	132,908	201,562	215,548
Burlington	100,000	80,933	8,635	22,899	12,785	31,534	21,420
N. Burling	1,000	848	86	299	214	315	300
Milton	9,000	5,503	777	2,062	659	2,839	1,436
Sub-Region	525,000	557,300	92,138	144,112	146,565	236,250	238,704
Airport	0	0	22,000	0	0	22,000	22,000
Oshawa	300,000	382,458	49,647	100,797	105,827	150,444	155,474
N. Pickering	80,000	102,786	12,880	23,920	17,578	36,800	30,458
S. Pickering	58,000	59,450	9,430	12,578	11,782	22,008	21,212
Ajax	24,000	36,746	3,902	5,203	10,795	9,106	14,697
Columbus	1,000	1,566	163	217	457	380	620
Bowmanville	15,000	10,538	2,439	3,254	1,062	5,693	3,501
Audley	3,000	3,683	488	651	624	1,139	1,112
Sub-Region	481,000	597,227	100,949	146,620	148,025	247,569	249,074
Urban COLUC	4,201,000	4,242,408	695,420	1,370,079	1,127,579	2,065,499	1,823,049







Ministry of  
Housing

Hon. Donald R. Irvine, *Minister*  
R. M. Warren, *Deputy Minister*